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"I cannot help plead to my countrymen, at every opportunity, to cherish all that is manly and noble in the military profession, because Peace is enervating and no man is wise enough to foretell when soldiers may be in demand again."—SHERMAN.

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THE ARMY AND THE CIVIL POWER.*

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THAT the army is on the side of the constituted authority, and is in all things merely a reflection of that power which is essential to its existence, is an assertion too apparent to be in need of demonstration. In view of this fact, the oft-heard charge that the army is an ally of capital as opposed to labor must be regarded as somewhat singular. Yet, just so often as the question has been put as to where the army stands in the conflict of capital and labor, just so often has the answer come, either promptly or meditatively, "On the side of capital." It may appear rank heresy to challenge an opinion that seems to be so universally held; nevertheless, I sincerely believe the purposes of our government, and, therefore, what should be the highest aims and ends of all, would be better served by refuting than by maintaining this opinion.

To have the army regarded as being, to a greater or less extent, an organization that may be used to the benefit or preju-

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dice of any sanctioned and recognized class is not only repugnant to, but subversive of, the principles of liberal government. Where such a notion is current, what should be one of our most popular institutions becomes vastly unpopular. The purposes and motives of the army are doubted, its necessity is questioned, and in many ways such a notion becomes an active agent in curtailing the army's use and usefulness.

It is not to be expected—nor desired—that the army should be held in universal favor. But there is no reason why all true and loyal American citizens should not hold it as high in their estimation as they do their popular judiciary. In fact, there is every reason why they should do so. Those who love their country and respect the laws its Constitution has generated; those who love liberty, right, and justice, and who have sufficient perception to understand that a high state of order is essential to their exercise; in fact, all who are patriotic, order-loving, law-abiding, and sensible should see in the army a safeguard, not a menace, and before asserting positively that the army is on the side of capital, or of labor, or, for that matter, any other side, a vast array of facts should be considered, among the first of which is the army's allegiance to duty and the Constitution.

To be told that the army is on the side of capital, were it so, conveys but a vague idea after all of its true status. Queries will follow. What is capital? What is labor? Wherein are they antagonistic? And under what rules and to what extent can the army be brought into their differences as an active factor?

Vast space would be required to enumerate all that composes the idea of capital. It may be material—such as land, railroads, money,—anything; or it may be more intangible, consisting of a knowledge bred from study and experience—such as a profession or trade; and it certainly is two hands capable of employment. In brief, capital is the possession of something capable, when put to use, of yielding revenue. Useless unless used, an energy must be exercised to give it value; and this energy, so used, is labor.

Under these broad but true definitions, capital and labor are seen to be inseparably interwoven, each in absolute dependence on the other. This dependence is not lost or changed under the narrower but more acceptable definitions that are used to-day to bring the ideas into clearer relief.

Under the natural law of things the mental power has so absorbed the material as to have lost its own recognition in it,

and capital under the present conception of the term has come to mean but the material power. Yet in any consideration of the subject it is impossible to lose sight of the mental element. By mental power, as here used, is not meant the power derived from education, but rather what may be called the power of direction. The latter does not necessarily include the former.

In the same manner the idea of labor has become restricted to embrace only that physical force that is employed, under direction, in the production or operation of the material power; while the pure mental power, unalloyed with the material, has been left out of the question. The attorney or physician, as such, is neither a capitalist nor a laborer.

Therefore, as it is in the material power that capital and labor touch, it must be in it that they clash. And in no clearer way can the social agitations (of which the labor question is but a part) so prevalent to-day be brought to light than in describing them as a struggle between this mental force and physical force—for the prize, which is in the material force,—as a contest between the man who tells how to do a thing and the man who does it for shares in the thing done.

That there is a clash is apparent to all; but that such clash is deserving of the name of "Conflict," as used in a military sense, is hardly correct. It is true that great forces are at work, and that great passions are awakening in response to great ideas that are surely, though slowly, arising to the light and taking form—a form, too, that means in its realization if not the birth of a new civilization, at least the death of the present one. Yet, though these ideas stalk openly abroad, corrupting or educating as the case may be, the power of the passions they are generating still lies hidden beneath the surface of society. The discontent and unrest are still more felt than seen. Public attention may be attracted now and then to an occasional eruption such as the assassination of a President; commerce for a moment paralyzed by some great strike; an army of rowdies on its way to conquer Washington, and, occasionally, a Governor lending his encouragement and approval. But such things fix the public eye only for a moment; for in a moment it is all over, and the public says, "What good sense!" and goes on about its business. However, the eruption has not as yet assumed such seriousness as to come under the head of a conflict when regarded from a purely military standpoint. That presupposes opposing forces separated by dis-

tinct lines, such argument as may exist between them being carried on with guns, not voices; and the persuasive influence lying in bullets, not ideas. Ideas and talking may be preliminary to a conflict, but the conflict itself has not yet come. It may never come. Society may find means to satisfactorily adjust itself slowly, by reformatory methods, to the changed conditions and the changing opinions of the present day, and may possibly dispense with sudden revolutionary measures. As seen, the subject naturally divides itself into two parts: First, concerning the status of the army in case social problems seek to find their solution in reforms; and, second, its status should these great questions merge themselves into an actual conflict and assume the proportions of insurrection, rebellion, or civil war. In the former case the laborer is the aggressor. It is he who is aggrieved and complains of his condition and seeks through organization to erect a power that, under direction, may meet on equal footing on the fields of commerce and legislation the power inherent in capital. As long as the reforms involved are strictly commercial and political, the part the army will play in them will be inappreciable. While the civil processes of justice and administration are in order, the functions of the army when called into action are necessarily those of police; and, in all probability, it will occasionally be heard of, as during the past, when it has been called upon to maintain order, prevent destruction of property in riotous communities, or see that the laws and regulations necessary to the course of the Federal Government are not interfered with.

In the latter case the status of the army is open to much serious and interesting speculation. A state of war is declared; and all other considerations must give way to those of military necessity. Civil law is subordinated to the iron rules of warfare, and the army, from passiveness, immediately becomes an agent of vital importance and an instrument by no means to be ignored. Upon it all things depend; to it all things accrue. But whether the Federal army as we know it to-day will be on the side of capital or of labor is a question, as said, of speculation. Its stand will largely depend on the interpretations and constructions that the then existing Federal Administration may impose on the Constitution. Liberty is a broad word, and the Federal Government has no more surety than a State that its executive will not expand it to hide justice. However, it may well be thought, that

should the government ever be placed in the hands of those who grossly defy or pervert the Constitution, they will have little or no use for that army that is sworn to uphold it. But if the government is in proper hands, there is no room for doubt or question as to the army fulfilling its duty and its oath to uphold the Government. In either of the two cases (the army as an adjunct to the ordinary police power, or when used strictly as an army) the nature of the army is the same; the different uses to which it may be put changing not one iota the laws and rules that govern and give it the name of army. Since an army remains the same under all its different phases of action, it is essential to a correct understanding of the subject to know just what an army is.

The current notion that any man with a uniform and a gun is a soldier should be dispelled. A great many men with neither uniforms nor guns are soldiers, and it is likewise true that you can uniform and arm some men forever and never make soldiers out of them. Nor is it skill in the use of weapons that makes soldiers. Many women are expert shots, and I have seen a girl go through the Zouave drill on a tight rope. Likewise the idea that a number of armed men make an army may be a mistake. Even though these men are organized and drilled to the perfection of a ballet, still they are not necessarily an army. What constitutes the true soldier lies below the surface—as far down as the soul. And it should be known and be believed that until the man, or the number of men, have caught possession of a certain spirit that makes obedience a religion, and embodies conscience in an order, that he is not a soldier nor are they an army.

A perfect army is a human machine, not inaptly comparable to a single human body; the various parts of the machine being bound pliably together by a mechanical discipline that answers in the place of muscles making it a unit, the parts of which are more or less independent. And further, through all the mass there must run a higher discipline—a spirit, called duty, composed of honor, courage, love of something—that answers as the nerve system, and renders each part responsive to a will. In the army this will be its commander.

Being a human machine it is therefore subject to all variety of human necessities. Food, clothing, etc., must be supplied. It cannot supply itself, so there is need of an exterior organization.

The fighting force and this organization working in thorough harmony form an army. Comprehending thus thoroughly what an army is, it will be seen that time must necessarily enter as a factor into its organization. Time must be allowed the recruit, no matter of what stuff he is made or how willing he may be, to acquire the habit of a soldier—a habit of obedience as essentially necessary as his rifle. Time must be allowed to permit supplies to find channels and flow freely and in order. Time must be allowed all round for the learning and unlearning of a most wonderful lot of things.

Against an army nothing but an army can be opposed. A modern battalion is invincible against any number of men, even though they may be armed, if such men lack one of the essential elements of an army.

One of the most pernicious deductions drawn from the Civil War is that the United States, relying on the patriotism of its masses, can instantly confront with a superior force any nation of the world should the necessity arise. Every argument that the professional soldier may advance to show that organization and preparation are essential to the success of a modern army is met and blasted by the sanguinity that says, "We could put a million men in the field to-morrow. We have done it." It is perhaps this feeling that accounts for that strange blindness that cannot see the moral that is written so plainly, for those who *will* see, on every battle-ground of the Franco-German and Chino-Japanese wars. It reads, that patriotism and numbers—even armament—are as nothing in the battle, unless that patriotism has taken time beforehand to prepare those numbers for an ever-coming emergency.

A standing army is supposed to have had this time for preparation and to be instantly ready to put into effect that terrible power arising from modern equipment in the hands of an organized and disciplined force. With an army discipline is the vital element, and it is worthy or not of the name just in that degree to which it renders unhesitating and unquestioning obedience. Organization and arms are of secondary importance, and reflect not on the army, but upon the patriotism and common sense of the statesmen within whose hands such matters rest.

It has often been said that our army is small and widely distributed; that its line and staff are out of touch; that it is endeavoring to apply German and enlightened tactics to a Chinese

and effete organization; that it is skeletonized to a point of uselessness; and that in it discipline has deteriorated. From a European standpoint it may have these faults; and faults which if they do exist, are deplorable when viewed in the light of a foreign invasion or war. But these faults do not pertain at home. It is still our army, and in it are to be found those attributes necessary to compose an army, and which, if not perfectly, are yet more highly, developed than in any other domestic organization that can be brought against it. However legislation may tamper and temporize, so long as it maintains an army it at least maintains. and cannot affect, the knowledge of the principles of war that must of necessity be engendered in the brains of those who make the theory and practice of war their constant study. More than anything else, it is this knowledge, which seems to belong to the army alone, that makes our army our country's only reservoir of reliable military power. And it may be stated that when, for whatever reason, the need of stern force arises the army must furnish it. Nor must there arise a doubt of its ability to do so. In the face of any such force as an unpreconcerted insurrection or domestic upheaval can bring against it, it is all-competent. Any spontaneous disorder or violence that is the result of disaffection must be more or less localized in the beginning. The confined limits of such disorder, the facilities for rapid concentration of troops, and their power and certainty of action against mobbish masses, make the size of the army fully sufficient to meet such emergencies.

Should the disaffection lead to simultaneous violence in many parts of the country, of course the size of the army imposes grave limitations upon its efficiency. Just the area coverable by 20,000 effectives is undeterminable. However, it may be said that it is of such extent that should it be exceeded, the upheaval would assume the proportions of a revolution the seriousness of which would warrant a declaration of war and the call for volunteers. A premeditated revolution in which ends are sought by means of warlike hostilities is hardly to be feared. The political battle-ground affords a so much surer and safer means of seeking reforms, that in all probability it is there they will be sought. In fact, it is only through a political conquest that any class will reach the first step to the power essential to prosecuting a war. Against the authority and credit—the moral and physical means —of the established government, no revolution can stand with

the slightest show of success. Should a revolution be organized whose first object was to gain through the ballot the control of the State, its purposes would probably be fathomed and provision made for the impending struggle. Such provision belongs to the realms of statesmanship rather than generalship, and undoubtedly in such a case the brains of the country would leave business alone for the moment as more necessary to deal with the question. Such an emergency is as yet a calamity unbargained for in our military policy.

Though an insurrection or rebellion against the Government is not to be feared, on the grounds of its utter hopelessness of success, for many years to come, there is, nevertheless, a form of revolution that is to be feared, and whose presence is near and menacing. I know that to claim that the prevailing conditions of this country render it peculiarly liable to a reënactment of the scenes of the French Revolution opens forth a torrent of repudiation from those happy mortals who can stand on the platform of the "What should be" and cleverly preach, argue, and reason from the text, "Our Virtue, Enlightenment, and Progress." In order to withdraw the subject from impeachment as being pessimistic I will grant they may be right in saying our advancement is such as to preclude the probability of so terrible a revolt. Yet it must be admitted by even the most sanguine that it is within the bounds of *possibility*. That it is possible is sufficient reason for alarm, and sufficient cause for the forming of policies and plans to meet such an occasion.

In any extensive project of Governmental defense it is impossible to ignore the Volunteers or the National Guard. The briefness of my essay, however, necessarily excludes the former. Of the latter, there are a few regiments to whom the word "National" is well applied, and who maintain a standard of military perception, and whose reliability and efficiency is so great that they cannot be otherwise than included in the term army as here used.

Of a revolution of the first character—that is, against the established government with the present conception of its functions, principles, and institutions—there is little necessary to say. Beyond its disability, the fact grows clearly apparent upon investigation that there is really no object to be gained by such rebellion. As said, under the present order of things the laborer is the aggressor. In the vast mass of literature that sets forth all

the woes and grievances of his condition there is small attempt to offer remedies. Most of those that are offered fail utterly when viewed in the light of common sense; and none that I have ever seen can offer half assurance that if put into effect they will make matters better, or even that they will not make worse what is now bad. The boasted enlightenment of the present day is exemplified in one respect at least. Men nowadays will not go through war in pursuit of a chimera. To entice them into it a surety must be given of some betterment. War must have an object, and that object must be crowned with a principle. In a rebellion such as contemplated no such surety can be given; its object would be indefinite, its principle obscure. On the other hand, if the ability were obtained by political conquests, it is barely possible that capital might be thrown upon the offensive by the enactment of laws against it. Of such a condition it may be said that labor is so entirely dependent upon capital that capital would probably be able soon to coerce a repeal. In the event of arbitrary laws, such as the seizure and control by the Government of all or certain classes of property, capital would soon become the oppressed and the aggressor. A war would in all probability ensue. It would be one of opinion. The Constitution would be called into question, pros and cons adopted, and the status of the army (if one existed) would be doubtful and dependent upon the individual opinions of its members. A precedent possibly may be found in a review of the effect had upon it at the opening of the last war.

Before dismissing this phase of the subject, it may be well to state that should a genius arise and evolve some plan for raising the masses in material welfare, he will be hailed by the whole world as "Greatest," and governments will be the first to bow; since it is in the condition of the people—that is, the masses—that they must ever read their glory or their shame. But the fiend who seeks to destroy what he cannot build up, and those who may be led by envy, hate, or lust of pillage, to follow him to acts founded on the doctrine that "What I can't have, none others shall,"—against these all virtue, enlightenment, and other worthy things are most sternly arrayed. The answer to the first is, Peace; to the second, War. With this brief guide to speculation as to the army's status should the question of capital and labor resolve itself into a war, that part of the subject is ended.

The character of the second kind of revolution mentioned, though certainly in no manner to be considered as a reform, places

it in that branch of the subject that deals with the army's use in case adjustment is sought by reforms. It is the most serious phase of the army's use in its status as police. The possibility, if not probability, of a revolution of this nature with its attendant horrors, implores in the name of the American people that their Government should give heed to the subject; that it should adopt some policy and decide upon some permanent plan embodying strict courses of action covering the entire subject of social disorder, from the germ—the individual anarchist—to the raging fever—revolution. He is but a poor physician indeed who refuses a case because it is disagreeable, or because the remedies applicable are stern, and a sense of duty so small brands him without, and undeserving, credit.

In all the governmental projects for the maintenance of law and order there must necessarily be included a provision for the employment of physical force. In this way the army becomes related to any project that may be advanced for society's protection against the creeds of anarchism. And through this relation it must connect, more or less, with that state of defection that makes anarchy possible. In this way only is the army brought into the question of capital and labor. And its status towards labor depends entirely upon labor's status towards anarchy. The army is opposed to the anarchist; and if labor makes him an ally, not only does the army maintain the imputation of siding with capital, but the laborer must find arrayed against him all notions of right, justice, and reason. The laborer who recognizes in anarchy his worst foe must recognize in the army his best friend. However, I can plainly see that a certain intelligence is necessary for him to comprehend this. In order to see this status he must have certain perceptions of the government under which he lives, of the army's functions in that government, his own relation to it, and more than all else be aware that there are certain great natural laws over which governments and armies and men have no control. These laws are not only uncontrollable, but to them all human regulations must conform. They affect and govern all affairs of life—the economic and social as well as the moral, mental, and physical condition of men. Condition nears perfection—men thrive and are happy—according to the ability to grasp and build and conform to the unalterable influences of nature. To the unrecognition or distortion of natural law, through mental incapacity or moral viciousness, is due all imperfection and suffer-

ing. A perception of these laws as applied to government (which includes the army) and of his own condition, are essential to give the laborer sufficient wisdom to be just upon the question of capital and labor.

To ordinary intelligence the necessity of government is apparent. The anarchistic creed of "no government," with its implied constitution "every one shall do as he pleases," would require the strongest and most intricate of governments to maintain itself. Unfortunately, what pleases one is very apt to displease another. Should this happen, who is to be pleased, who decide, and who enforce the decision? Not much imagination is required to picture the turmoil and strife that would ensue if there were no power above the personal contestants. In such a case the right would rest with the strongest. Moral right would not exist. Stage by stage all weaker would be subjugated by some one stronger, until at last all the powers of dictum and control would centre in an ultimate head, and a nation would be formed. This would be the point where moral rights would begin. Though strong, the head finds in combinations against it a power still stronger. They make demands for release from tyranny. Self-interest leads the combination to demand freedom, and self-interest leads the head to demand a protection which it would not have if it yielded to the importunities of the combination. Both powers being uncertain of their strength, they compromise on justice which, after all, is but a compromise between the conflicting interests of liberty and safety--of the strong and the weak. Thus it is that justice creeps into a government, and widening gradually as new combinations gain power to force its concession, it eventually comes to include a whole people and a democracy is formed. At first the concessions are entangled in many reservations; but as time advances, they throw off all encumbrances, and come at last to stand clear and apparent in men's ideas as rights.

Absolute anarchy would place mankind back again at the world's beginning, and after universal strife had run its course of depopulation, there would again occur a certain order resultant, at first, from an acknowledgment of the right incident to the heads of families: then tribes and clans would be formed with right conceded to lie in chiefs; then in monarchs; then, probably, in a class; and, after a time, back again to where it now is, with the people. Through the trend of governmental progress two great facts stand out. One is the craving for liberty and equality,

in which man seeks to acquire and maintain an acknowledgment that certain or all rights are due to him ; the other, that up to the present time this acknowledgment has only been attained through force; for in a government of men verily "right is might." Men to-day are prone to think of the liberty they enjoy under the acknowledgment of their broad code of rights as a thing incident and natural to them, and to forget the centuries of fierce struggle that has brought them from that state in which liberty consisted in the right to kill or capture whom they could, into that state in which universal liberty is possible to the strong and weak alike by the power that comes from an acknowledgment of that great moral principle—justice.

Though men have been raised step by step from the liberty of wild beasts to the fearless freedom they now enjoy, yet, never theless, the change has not affected the natural law that nothing is wrought or kept except by energy. Some power must be supplied somewhere or decomposition will result. Since each step in advance made by civilization has been obtained by force, this same force is naturally expected to maintain it. Since the individual is as nothing against the many, he is forced to seek shelter under some power that will afford it. This power is government. A government having been once established by creation or change, it becomes the representative of the power that established it. To the limit of this power it is absolute, and no difference in name it may assume changes the fact. Through the government the will of him or them who establish it finds expression; be it the single man, the class, or the people. This will dictates the right and can enforce it to the limit of the government's strength; a voice that expresses the right issues a command that is supreme. This must be so, or else the government ceases and becomes vested in him who assumes and can enforce the right to violate the right.

Since a government is the source of rights, and since reason plainly points to the fact that these rights should be used to the benefit of those who come under a state's jurisdiction, it follows that that government is best which so uses its might as to accord to all just those rights that result in the largest degree of welfare to the most, and at the same time places effective restrictions on all tendencies to encroach upon the rights so accorded. An ideally perfect government would be one in which, with infinite pains and wisdom, the character of each separate subject was analyzed and

all the desires, proclivities, and even whims, found in all separately were massed, and a code of rights framed upon such analysis, in such manner as to give precedence in exercise to the degree in which the characteristics thus brought to light showed preponderance. Many desires would be found universal and in no way conflicting with the desires of others. Some would be found entirely antagonistic to society's peace, harmony, and general welfare, in that they were opposed to other desires shown to be largely in excess. Having thus put the populace under dissection, and with an infinite refinement of adjustment, balancing, and rejection, having framed the aforesaid code of rights with its accompanying restrictions, a perfect government might result. But it would only be perfect for that day in which the analysis was taken; the next would find many differences. A perfect government is an impossibility. Its nearest approach is that of framing in an almost unalterable constitution a guarantee of yielding to the people those desires that are not subject to change, while leaving to the people to adjust those that are as expediency may dictate.

In fact the most theoretically perfect government is that under which we live. Its wonderful Constitution enumerates distinctly all the most permanent desires of mankind. Every beneficial or worthy desire to which men are given will fall under the heading of life, liberty, and property. These, it declares, shall be vested in each separate subject, and in the light of its might we live and act in all the freedom that is consistent with justice. Our Constitution may be likened to the will of an infinitely wise and beneficent monarch whose every impulse springs from love and justice and good will towards men. Though it is a written instrument, nevertheless, is its sovereignty complete, imperious, and absolute. It is our king, and truly demands all the respect and allegiance ever due a king; for it, as a ruler, has assumed the right to clothe each of us with that liberal degree of sovereignty over our own acts which is limited only to the extent that such actions shall not interfere with the same sacred freedom that it rests in others. To deny its sovereignty is to deny our own. He who strikes it injures himself. He who would throw it over is guilty of the highest crime against mankind. It is the realization of that dream—the embodiment of all those wishes—for which millions of men have fought and died that they might build a government under which they might live and be men.

XUM

Under it all reforms are possible. It is the stepping stone to a higher civilization than the world has yet produced. Destroy it, and mankind will be forced to replace it by ages of labor.

A philosophical as well as a practical knowledge of the Constitution is essential to a complete comprehension of the magnitude of its influence. Its practical side, namely, the States it forms; the departmental divisions under which it performs its functions; the powers it grants and implies; the restrictions it imposes, etc., are too well known to need dilation. Sufficient be it to say that an appreciation of its purposes will be sure to engender a respect for its methods. The people, through their representatives, make the laws. The only limitation that is placed on the making of them is that they must conform to the principles of the Constitution. But with the making or justice of law the army has nothing to do, and becomes related to it only through the executive power. In the relation borne by the executive to the law and the army's relation to the former is found the key to all the functions and uses to which the army may be put in any controversy that the Government may be called on to decide. The relation of the President to the Government is found in the oath he takes to preserve, protect, and defend the Constitution, and in the injunction that he shall take care that the laws arising under it are duly enforced. Insomuch as the Constitution is the origin of all rights, it becomes apparent that if it is not preserved, defended, and protected, that the rights it gives must grow unstable and uncertain. The President is chosen by the people, and gives his oath to them that he will perform this high trust to the best of his ability. Farther, as to the enforcement of the law arising under it, it is clear that no law is better than a law unenforced. Government being acknowledged as necessary, and law being the vehicle through which it performs its functions it necessarily follows that the law must be obeyed, or the functions of the Government become useless, and through them the Government itself fails. All conduct and actions arise under a will. If this conduct disregards, or is in defiance of, the conduct prescribed by the Government through its law, necessarily that will establishes a law of its own. Plainly, if this were allowable there would immediately be a return to anarchy. That a number are concerned in the conduct against the will of the government does not change this fact unless that number reaches the majority. Politically the majority is supreme. But as the law is the creation of the majority,

there is no necessity for so great a number to defy it. If the law is disagreeable wherefore is it law? If, through the will of the majority, a good law is passed, it is a benefit to speedily enforce it. If through misjudgment a bad law results, its enforcement will make its evils apparent and hasten a repeal. Disregarded or broken, a bad law may stand indefinitely, and create a precedent for the breaking or disregarding of all law. Disrespect for law is the insidious vice that is a republic's worst foe; and enforcement of the law is this vice's only cure. Law finds obedience in two ways: one from the moral or mental perception of right and wrong belonging to most people, and which gives rise to that sense of duty that makes obedience to the law a personal obligation; the other includes those that render this obedience only through the fear that disobedience will result in punishment. Of course, to the former the law need but be promulgated to be obeyed, and upon this class the stability of all government rests. Nationally they are our Government's life; and should they ever sink below the majority the Government would die. To the latter class are chargeable the millions of money, and the waste of labor that is necessary to maintain the general welfare. The figures of the men employed and the money spent every year throughout our Government for the enforcement of law are appalling; yet when considering the nature of our Government, they become not half so serious as the fact that they are necessary. If a review of the magnitude and influence of the law-breaking class would bring the conservative from his shell or wake the optimist from his dream, it might be well to do it. But I fear nothing will ever have that effect until their lives and property are endangered. All that can be hoped from them, since they will not aid, is that they will not offer opposition to those governmental plans that may be formed in furtherance of the public safety. If ten times the money spent and the men employed would result in decreasing the evil for which they are used, such result would certainly justify the means. But instead of this, there seem to be just those means employed that are sufficient for the immediate necessity; and, in some few years, we are sure to see ten times as much money and ten times as many men employed in suppressing a ten times greater law-breaking class.

When this class reaches to such proportions, its power—inherent in its aggressiveness—will arise to play a potent part in state affairs. It is said, and history affirms it, that democracies have

to look forward to their downfall through its law breakers—its mobs. The life of mob government, however, is short. The disorder resultant under such a government gives to order itself an omnipotent power. Both for ambition and protection, the observing and the wise form themselves into an army, and then this army, from the power that order gives to it, begins to rule the mob and take possession of the state. Neither the mobbish nor this military government acknowledges any other right than that which springs from might. In either case men lose the moral foundation of civilization, and must return again to the physical. Considering the evils that lie in these forms of government, it becomes the duty of the good people while they are yet within power to place upon the tendencies to revert to such all manner of restrictions. In no way can this be done more surely than by breeding in the populace, through a respect and fear of law, a civil discipline that will carry it through that restless period of free ignorance that demands, and cannot see why it should not have, all things at once, into that state of wisdom that sees it now has more than ever before and is willing to strive and patiently wait the rest. All that is needed to tide this nation safely over this period are wise laws that follow closely the broad principles of the Constitution, and a good and wise majority that demands that these laws shall be rigidly executed and enforced. To-day the vast energies of every government are being frittered away in an endeavor to maintain itself against its own law breakers. Were the same energy applied to advancing their material interests wonderful strides in progress would be made. It is not difficult to comprehend that a nation under perfect civil discipline, choosing wise leaders and following them implicitly, would be an instrument with which a great social leader might create that ideal state where the highest moral, mental, physical, and material conditions are limited only by the boundary of human conception. Of course no such nation will exist until the millenium. The thought is merely uttered for the purpose of perhaps rendering more apparent to the many who are apt to regard law with laxity and at the same time desire mightily to better their condition, that it is in the keeping of law and not the breaking of it that their desires will reach fulfillment. A library might be written on the subject of law by almost any one; but all the army wishes to have acknowledged is that obedience to law is rendered imperative from every moral and material

standpoint. Having had this acknowledged, any censure for itself or its use must be reversed in any conceivable action it may take in civil controversies. How the army may come to be employed in any civil function is too well known to need a rehearsal of any length. To place a man in a position and tell him to do a thing without providing the means would be an absurdity. The President is told to uphold the Constitution and see that the laws arising under it are faithfully executed. To perform his functions certain departments are given him. All of these but the army and the navy, presuppose a desire to obey or at least to offer no resistance to the law. The judicial department, it is true, contemplates a certain amount of disobedience, and meets it through the agency of its marshals. Their power, however, is only such as can deal with isolated and comparatively defenseless offenders. The employment of large numbers of deputy marshals should be discontinued. It is expensive, and not only useless, but a positive interference with the suppression of any disorder organized on a large scale for the violation of law. It amounts to meeting a lawless mob with a lawful crowd. When the resistance to law passes beyond the control of the civil power maintained for the purpose of enforcing it, one course alone is left open to the authorities, and that is the employment of the military power. The frequency with which resistance has risen so high shows the maintenance of this power to be necessary. In each State of the Union the occasion has arisen in which the civil power has had to be maintained by the military, and the same has happened with the Government. The calling forth and use of troops is a function of the executives of State and Federal governments. Their power to do so gives credit and force to the law by supporting it against all resistance. When shall the executive use his military prerogative in calling forth troops? The answer is found in the nature of his oath. Practically, it amounts to swearing that he will maintain the law. Then, whenever it is believed that the emergency arises, he not only can, but it becomes his stern duty to, suppress the law's violation by every means within his power. An executive is chosen by the majority for this purpose. The majority is supposed to know the nature of the oath he is compelled to take.

But, having taken the oath, his responsibility to God and his conscience is before even his responsibility to the majority that elected him—certainly far before his heed to the clamors of any

majority that may follow. This is one of the safeguards to liberal government. A man, no matter by what tricks he may have been elected, immediately on taking his oath, finds that his duty lies on the side of liberal principles and against any majority that may have elected him for other purposes. Of course this does not effectually check the election of corrupt men to office, but it does add security so long as honorable men are chosen, in that, with such men, duty must ever be before opinions. It has become recognized that there must be some check for the grave contingency of finding insanity, ignorance, or corruptibility in high places. The acknowledgment of grades in civil and political authority is most certainly the only way of imposing effectual and suitable restrictions on the serious evils that are likely so to occur. This principle invests the President with a character of constitutional guardianship so wide that its influence falls upon every citizen claiming his rights to arise under the United States. Upon this fact is based a large number and variety of cases in which it is left to his individual judgment whether the violation of law demands suppression by military means. There are certain other cases in which it is not optional. The first class is not dependent upon his own sense of duty, but the confidence or doubt that may arise that some one else is sensible or not to theirs. There can be no question or doubt that when the laws of, or arising under, the Constitution are being violated, it is his duty to suppress such violation, and especially so if the direct protectors of such laws fail or are in league with the violators. In troublesome times, all logic shows, high centralization is demanded in the interests of security. In times of peace and quiet wherein lies the difference? An acknowledgment of the entire sovereignty of the nation being reposited in the Federal Government is a great step towards our preservation should we ever need to exert our ultimate strength.

The time, emergency, and manner of the army's employment by the President are primarily dependent on his judgment. The oath he takes is constitutional and gives him vast latitude. Congress may, and does, provide for the army's use in certain emergencies of a purely civil nature, and limits its use in others; but any laws it may make must fail if in any degree it endangers the safety of the Constitution or limits the President's power to uphold, protect, and defend it. It never has attempted to do so. However, this being a government of law it becomes necessary to

have law's approval to its own enforcement. This may be done under the constitutional provision that the army shall be used for the protection of the state "against domestic violence" and the statutory enactment that it shall be used "for the suppression of insurrection"; and farther, when the authorities of the state are "unable to protect or from any cause fail in or refuse protection to the people." No more law is necessary. Under these broad headings the army's use is legalized for any purpose, from interference in a lynching to an insurrection that involves half the poplace, and at any time, or in any State or section of the country, as the judgment of President may direct. Half the remedy for disorder of this character is promptitude. Doubts lead to hesitancy. Therefore, the power vested in the President for the employment of force is, as it should be, complete. Be it understood, this power lies in the President alone, and it in no manner gives the army, as an army, the slightest excuse or option in its employment. In fact the whole civil community is peculiarly sensitive to any trespass by the military power. In no other government are the laws so stringent in confining the soldier strictly to his place. So much so is this the case that a soldier, as such, is prohibited from taking part in any civil disturbance—under the law a town might be burnt down before the eyes of a regiment and it be powerless to interfere, unless the authority of the President were obtained, and he directed the troops to take action. Under statute, however, troops may be employed to protect Government property, and in such a case as stated it would be possible to stretch a point and give aid under pretense of this law. But there should be no need of pretense. When authority stoops to it, it loses the moral influences of its dignity. There are many instances where right and justice are so apparent, and prompt firm action would be of such vital importance, that the law would do well to make statutory some degree of discretion in commanders subordinate to the President. Owing to the promptitude with which orders may be obtained by telegraph, the necessity or benefit of such discretion is not evident in ordinary times. But in times of great commotion the wires would be cut and communications interfered with in all ways, and a regiment or even a company might be left inactive, or acting upon its own responsibility, in cases where the moral as well as the physical power of the Government is needed to render any action decisive. It should be remembered that the greater part of our small army's

strength lies in the moral power behind it, and nothing should be left undone which will enhance this power. It is true the President has power to delegate a moderate authority to commanders. This was done last year, and was a great step in advance to giving security to Federal law. The order giving this power was limited to the security of public property, and the enforcement of those Federal regulations necessary to the course of Federal business. It has the effect of making the army practically, a national gendarmery—limited, however, in its exercise, to strictly governmental affairs. There is no reason why its functions as such should not be extended to embrace State and municipal affairs. By placing wise restrictions and limitations upon such use, unquestionably the army would be placed in a position to check disorders in their germ. Such a course would go far towards placing the improbability of serious revolution upon substantial grounds. The necessity for some such protection as this is already recognized. Chicago demands, and gets, a force of Federal troops stationed near her. But why hide the purpose or keep secret the fact that her every interest is threatened by the character of a large number of her citizens? All the observing know the truth. It is not Chicago alone, but every large city. Were the authorities of the country, in the interest of civilization, to boldly acknowledge the evil and adopt stringent measures, if not for its suppression, at least for its restraint, those who love law and order would rest more easily.

In reality, the army is now a gendarmery—a national police—in its civil relations. But the fact lacks acknowledgment; and in this lack of sanction by bold laws to this effect, its action is uncertain, doubtful, and, naturally, curtailed in its power. That the army would lose character as an army under its new rôle—is not admitted. In the President there is vested a dual power. His functions are both civil and military, and he is the highest officer the Government affords of each. If he employs the army in his civil capacity, the army becomes a gendarmery, whether it will or not; but if he assumes a military attitude it then becomes an army. In other words it is an army or gendarmery as the President may direct. But, as previously said, both are identical in nature, and it is in the use merely that the name changes. The army, as an army, would be benefitted by a dissemination throughout the country of military notions were it used and acknowledged by law as a gendarmery. The nature of an army

would become known. There would no longer exist the idea that it is an independent sort of body, floating around somewhere, that occasionally drops in to do some mischief, and then retires, leaving behind it all manner of censure and foul abuse. Instead it would become known for what it is—a stern reality, a power for good in the hands of the good.

By continuing to elect honorable and wise men to the Presidency, and framing laws sanctioning the use of the army, within Constitutional limits, as a gendarmery or national police, to be held as a reserve in case the civil police fail or are unable to cope with the law-resisting, a great additional security would be given to our great cities. To accomplish this result there need be no radical changes in the army or its manner of employment. In fact, events themselves have pointed the manner. It is merely necessary to place the army behind an injunction of a United States Court, as well as behind the Presidential proclamation, in order to apply its force promptly and directly in any emergency requiring force. The nature of an army makes it peculiarly applicable to this service. Discipline places it beyond the influence of prejudice. When called into action it is merely a machine, and is as irresponsible. The President is the army's commander-in-chief, and its duty is to render him strict obedience. Duty is an army's highest law, and supersedes all other law. There is a law evincing a desire to make punishable obedience to an unlawful order. We are taught that the gravest military crime is disobedience. The law that would make it criminal to obey places the soldier in the position of being liable to punishment if he does or if he does not obey. It may be said that every true soldier, performing his function as a soldier, will obey his orders without regard to their lawfulness, unless, of course, such orders display on their face an insanity, criminality, or disloyalty so apparent as to be beyond question. The man who is willing to face death itself if commanded to do so by his superior, is rarely, or never, the one that will stop to haggle over a legal technicality. What kind of a comic opera of an army would it be that on receipt of orders would sit down, put on its spectacles, pull out musty old law books and calmly and leisurely proceed to test their legality! Soldiers are soldiers and not lawyers. The law lies in the *origin* and not in the obedience of an order. This must be so or the army ceases to exist, and becomes not only useless but dangerous to the State and itself. The consequences of obedience may be

death or civil prosecution; but duty rules. And if the President sees fit to employ his army, or a captain his company, it is, and should be, exactly as if they shouldered a gun and did with their own hands any shooting that might be necessary. In such a case no one can hold the gun to blame for any damage it might do. Blame could only be attached to it if it hung fire or went to pieces.

All the notions I have advanced covering the character of an army and its relationship to orders are exactly those that every one would hold were our army acting on foreign soil or against a foreign enemy. It is only when considering its relationship to our civil community that hazy conceptions concerning it and its actions are likely to occur. Responsibility is attached to it as if it were a sort of licensed banditti, of which not only each part but each member should be held accountable and punishable for any forcible measures that it may be ordered to take. In so regarding the army, not only its character and relationships but all the principles and dependencies of the institutions of our Government are ignored. The lawfulness of an order rests in the originating power. It is this power only that is accountable. The President as commander-in-chief is the repository of all military power. For military purposes it is necessary to disseminate and vest in different grades of officers a certain power to command; but the power so given is merely delegated. When the corporal commands his squad it is practically as if the President himself issued the command. For convenience he has embodied in written orders certain regulations under which military functions are performed. But these regulations relate solely to the interior administration and exercise of army organization and discipline. There is no code of rules to specify upon what occasions the army may exercise its force toward any others than those who are its own members, or in some way connected with the military subjects of the Government. The power to regulate and exercise this force remains firmly under the personal direction of the President. When he commands, the army moves, and it is immaterial to it whether it be to start a train or stop a train. The train stops or starts as he, and only he, has power to direct.

It is clearly seen where the responsibility for the army's acts lies. It is with the President. Nor is it desired or advisable, nor would it hold, to have it even partially transferred to other hands.

In the foregoing I have endeavored briefly to show that the

Government under the Constitution gives and agrees to protect in its subjects certain rights; that these rights being embodied in the law, then, that in the sanctity and maintenance of the law rights must look for their preservation; that in the President is reposed every moral and material obligation to execute and enforce the law; that unless it is enforced, the Constitution and the Government fail; that there is a certain class that require force to make them keep the law; that the army is the instrument by which the force is applied; that the army neither looks for censure nor for praise, except as it may be criticised or praised for its quality as such an instrument; and, farther, to suggest the *possibility* of serious civil trouble, and advance the idea that such trouble may be best met by boldly acknowledging it, and, under express laws for the purpose, stationing the army in and near large cities with the avowed character of a national military police or gendarmery. So long as the President can command, there is no necessity for any change in the army's present status. It is only a provision for the contingency that he cannot always be communicated with, or with such delay, as to decrease efficient action by the tardiness of its application. The municipal or State authorities should be permitted to apply directly for aid to the nearest commander of a military force in case a serious riot; in case of the *expectation* of such, then through a United States court. And in any case a commander should be allowed to give heed to a call from a United States judge. This, for the reason that such judge would always give ear to an appeal for protection from any body of people who believed their lives, liberty, or property endangered from lawlessnes, and who had also cause to believe such protection would not be afforded by the local authorities. With proper discretionary powers delegated by the President in certain commanders, according to their location, to act in moment of need in conjunction with a Federal judge—with or without the President's approval according to circumstances—another great advance in the security of constitutional rights would be gained. It would at the same time take away, to a great extent, any doubt a commander might have whether this or that action were in accordance to law and for which he might be liable to civil prosecution.

There is only one other principle to be recognized in order to make the establishment a gendarmery complete. That is, that when the soldiery are called into action it is by the power arising

from this sovereignty of government. For the full performance of his duty it is necessary that the soldier should be free. When in action the ground he occupies is his sovereign's, and should be acknowledged as such. He occupies it under the directions and might of the Government; and any power that can remove him by command must be greater than that inherent in government. The city policemen, the mayor, or the governor who orders a Government soldier in the performance of his duty to move an inch exceeds his authority. If this were not so, wherein would be the use of soldiers? On what singular conceptions of government or curious system of logic these erstwhile enemies of the Government at Hammond, Ind., founded their excuse for swearing out a warrant for the arrest of Captain Hartz, who was obeying the orders of the President to see that an injunction of the U. S. court was upheld, is a conundrum beyond the guessing powers of the average intelligent American citizen. This idea of town rights was something of a shock to those that had believed that even State rights was a question carefully settled some time ago.

As a natural right the soldier must claim that a martial law ever attends him during his period of action. If in any manner he is amenable to any other power than that of his Government, and his Government acting through military channels, two facts are apparent, either of which may destroy his use. One is that by arrest, or threats which he knows may be carried into effect, he becomes useless for the purpose employed. The other is that if he is amenable to any other jurisdiction than the military, and this jurisdiction be permitted to order him to do or restrain from doing that which he has been commanded to do, it has the force of giving an unlawful character to the performance of his duty. To uphold law by unlawful means is a paradox certainly not calculated to breed respect for law in the lawless. Besides, how can he be amenable to any other power? The power that places him in action is the origin of all power—he, personally, is not responsible for his position or his actions, the power that places and commands him is that; and, if he is amenable, the power responsible for him is also, and if a lesser can challenge successfully a greater power, it follows that the lesser dominates and has succeeded to the greatness of the other. Since the Government is in a sense, a protective institution, its first duty as such is to protect those upon whom devolve the duty of protecting it. Again, the fact of military employment in a community for the suppression

of disorder implies the temporary incompetency of the civil authorities of that place. This incompetency may rest in insufficient force to maintain order, or in a prevention of force to the detriment of good order. In the former case the military becomes merely an adjunct, or a part, of that municipality's power. If so, wherein would be the sense of lessening its own power by an undue interference? In the latter case the military takes the place, in the interests of good order, that has been vacated by the prevented authority. Reason, justice, and security, demand that the soldier in the performance of his duty in civil strife be made immunitable, and that in the moment of need the civil authority should be subordinated to the military. This is martial law. When the vast interests under the guardianship of our Government are considered, and when events have so clearly proved those interests to be in peril and in need of protection, the question must come almost impatiently from every intelligent and patriotic citizen, "Who does,—who dares—offer opposition to plans that have for their object the giving of more and more perfect security to that guardianship?" Who are they? It is to be regretted that their name is legion. To one class belongs the optimistical theorist who delights to travel on wild ideas—when he believes them or attempts to put them into practice the world calls him a "crank." To another class (and a really large class) belongs he who would witness a revolution, a tottering government, and burnt cities, and would ejaculate the day after "That was interesting—What next?" These classes and many others with various idiosyncrasies, are not serious opponents to governmental security. But there is a class whose opposition is so serious as to make all such purposes failures. This is the labor element. Why? A laborer I asked told me, "Because the Government is the rich man's friend." There is no room for argument there. It is; but envy, spite,—something, I know not what but I am sure it is no good thing—so shortens their sight that they cannot see that the Government of the United States is an ideal one for the laborer himself. If he were to sit down and endeavor for a hundred years to construct a better government—for himself—he would fail. Not only this, but he is more vitally interested in the maintenance of the laws founded in the broad principles of the Constitution than any other class. Under any other form of government the "rich man" of to-day would be he who through force, cunning, hire, etc., would see that he himself enjoyed life,

liberty, and the possession of his property, and most probably at the increased expense of the poor man. It would be transferring his lease of rights that is now granted by a power in which he has as much to say as anyone, and taking out another lease contingent upon, and as precarious as, the will of a single man, and a will over which he has no power of control. But the laborer can't see this. Mention the rich man, and immediately the poor man becomes blind to everything but that condition for which he holds the rich man responsible. Ever since the world began some have controlled and others have been controlled, and the same condition of affairs will go on until the world ends. It is a natural law. Fowls and animals follow leaders, and men more than either of these are dependent upon them. Yet just in this fact lie all the evils and all the possible virtues of socialism. Socialism clamors for equality—equality first of political condition. This was fulfilled in democracy. But having attained political equality, that he is better off, depends upon many things. If he has perception to see that it is a natural law that society must be governed and that it requires a mighty power to do it, and adds sufficient wisdom to account himself merely as a factor of that power to see that he is governed properly, and knows what properly means—then for him democracy is a benefit. But if he believes he can acquire permission under this power to defy another natural law which says that men are absolutely dependent upon each other—and in this dependence one is benefitted only by the suffering of another unless justice be the means of binding them together— then democracy fails to benefit him.

It will be observed that the first does not destroy the idea of a Supreme Sovereignty. This is not torn down, but rather it is recognized and men endeavor to elevate themselves by sharing in it and imbuing themselves with a certain degree of its power. The latter are sure to find out, sooner or later, that the sovereignty is still in existence and has over them absolute control even to the deprivation of life, liberty, or property. The problem confronting Progressivists to-day is how to maintain mankind in its present degree of civilization until the masses have become so enlightened and refined as to appreciate that advancement and improvement of all conditions must follow closely along the line of moral precepts. The experiment in democratic principles in which we are now indulging has taught the wise one thing: that is, that the goodness of conditions is not dependent on the num-

ber constituting governmental power, but is absolutely dependent on the virtue or the vices of the will that directs. A bad or foolish majority is as great an evil as a bad or foolish single sovereign—worse possibly, when its irresponsible character is considered. Another fact rendered apparent is that a majority has exactly the same proclivities as individuals. The Constitution counteracts both these effects, because it is a permanently good and virtuous will directing the power incident to sovereignty. If failure of good conditions exists, the fault lies not in it, but rather in the disobedience or failure in wisdom of its subjects.

But as the country fills up and men are forced together in crowds, so that wherever they go they must still encounter crowds, they find that other influences besides the political must be bargained with, and that they are forced under other natural powers and must conform to other natural laws. They find that material and political conditions are by no means co-incident; and that the government under which they live might have all the virtues of a God, but still be limited in its power to provide them with food, clothing, and other necessities. The laborer finds that he must work. No government has the power to maintain him in idleness. At what and where shall he work? In the recent undeveloped condition of the country he could go where he pleased, work at whatever turned up, and be reasonably sure of a livelihood; but the crowding together has had the effect of lessening this independence. This former independence led him into all the recesses of the country; and wherever he settled and worked, development of the resources of those places followed. Every place has certain resources; that is a condition of nature which by human labor will supply human wants. These he naturally exerted his labor upon, improved, and developed, and the resources became capital and, through justice, his own. Now, wherever he goes, he, finds the resources in the possession of some one else. He can no longer work for himself, but must labor under the direction of some other. The promise of independence that undevolpment held forth has gone. He is fortunate indeed who can discover a new resource or invent a new purpose for an old one. To such, independence in degree of the benefit of such discovery or invention, is due.

Under the present condition the masses have become employees of the comparatively few employers. The capitalist and the laborer have been created. Existence requiring men to labor,

they must have something upon which to exert their labor; and the capitalist supplies it. But the capitalist is governed in turn by the imperative laws of supply and demand. These are regulated by the varying quantity of human desires and these in turn regulate prices. If there is no use for a thing, it is valueless, and in turn renders valueless the labor invested in it. Again, if there is more of a thing than can be used, some of it is valueless and a compromise results in lessening the value of the whole product. Otherwise, the labor invested in the valueless part would be worthless; whereas if the loss is disseminated, the value of the labor is only reduced. Anything that increases the number of things demanded or increases their use, likewise increases the value of labor. The capitalist, regarded as the supplier of fields for human energy to exert itself, becomes merely an agent of labor. It is he who has discovered and developed that infinite variety of wants and desires in mankind which to be satisfied creates new demands and advances prices to labor. Had there never been a capitalist, the laborer as well as the rest of the human race, would have been running round eating roots, in a most savage state. Moreover there would probably have come a period where the population was so great that there would not have been sufficient roots to go round, and it would require some system by which the supply should be increased or the consumption limited, or the race would starve. This implies control, and control implies some sort of organization. To organize is for the purpose alone of conforming to some general rule or rules. An organization must have a head, and this head must be obeyed. It regulates and proportions the quantities of roots, say, that each member shall have. All justice demands that those who do the most in gathering or producing to increase the common stock should have precedence in the distribution. If in so simple a case organization is demanded, how much more necessary it becomes under the infinite variety of trade conditions existing in the world to-day! Since the capitalist supplies the resources for labor's employment, and this labor to be of benefit must be organized, naturally the capitalist becomes the head of such organization, and he governs, regulates, and distributes according as the varying conditions of trade dictate. It is apparent that he cannot distribute more than he has. If he does the organization itself must be suspended. Therefore if the distribution is meagre, or not sufficient to supply the wants of the members, and the head

is doing his best to get more to distribute, how can any complaint be reasonable or sustained by justice? Is it not rather a complaint against circumstances over which men have no control—the desires of the human race? This assumes, of course, that the capitalist is just. If he is not, then the rule holds in commercial as well as in political affairs that his gain is some one else's loss. The laborer says he is not just: he claims that he is. Naturally the only way to find out is to call in a disinterested party to review the matter. The term "Arbitration," correctly understood and carried out, would certainly establish justice at least, between employer and employee. The above is the question of capital and labor as understood by the average citizen.

I have my doubts, however, that if justice in trade dealings were rigidly enforced it would allay the complaints. The rebellion by the laborer is against his condition. In thousands of ways enlightenment has come to him, elevating him and breeding desires that perfect justice in money affairs would still leave him without sufficient means to satisfy. He is restless and dissatisfied. He compares the fine house to his own wretched dwelling. Seeing no means of obtaining one as good, he hates the owner and would tear down his house. As long as this is the spirit that animates him, his place will be in the humble dwelling. Actuated by this feeling, men can accomplish no good for themselves or for others. It is *possible* for all men to be tenanted in good houses, with sufficient to eat and to wear, and with leisure for improvement and enjoyment. But a position so perfect contemplates a patience so vast and a discipline so perfect throughout the masses that the idea becomes utopian. A million men operating under good and wise leaders, and submitting themselves to a civil discipline as perfect as that governing military men, could maintain themselves and build a community that would be perfect as far as the material welfare of its members is concerned. It would require a coöperation, however, in which injustice, envy, spite, etc., were entirely wanting. There would have to be an acknowledgment of grades and ranks of authority. It is impossible to do away with that natural law that there must be a governing power, and that this power, to effect its purpose, must delegate and invest in subordinates degrees of authority. This holds with the State, the Church, finance, everything else, just as it does with the army.

Yet, not seeing this, the laborer would tear down—that being

so much easier than to build up. He is in a mood to lend ear to the communistic and anarchistic theories of to-day and do away with justice, property, and rights. This will not be permitted. If he attempts it, he renders himself liable to severe punishment. If he encourages it, his welfare should be of no consideration to others, since he makes it no concern of his own. If he maintains the law, and seeks through just means to improve his condition, the world—being a laborer itself—is with him. He may "strike" as much as he pleases—it is legal, but foolish—foolish because it has a debilitating effect upon all arms of labor, and, moreover, it is not very reasonable to expect to force a man to pay more by decreasing his profits. But, anyone has a right to say for whom, and for how much, he will work. Likewise a man has certainly a right to say whom he will employ, and how much he will pay. Both are perfect rights under the law.

So far the law or the army has nothing to do with the question. It is only when in the progress of a strike the lives, liberty, or property of capitalists or laborers are endangered that it becomes the duty of the law, through the Government, to act. A laborer has no right to say that because he won't work no others shall. Attacks upon non-union men with weapons, clubs, or intimidation of any kind is clearly unconstitutional. Nor has he the right to destroy property—anybody's—for any cause. When he is guilty of these things, either by overt acts or encouragement given to others, he places himself as much outside the protection of the law as if he were a foreign adversary. In fact he becomes a public enemy. I know too many laborers to believe that they are as a body capable of these things. But there is a large class —the lowest class of laborers and foreigners principally—who are tinctured with anarchy, and secretly and openly advocate any measures that are riotous and incendiary. They call themselves laborers, and thus form a kinship, and find a support, among the better elements. They are laborers, it is true, but of a class that hangs like a millstone around labor's neck. It is this class that civilization must guard itself against: and the true and loyal American laborer is interested as much as any other class, if not more, in their suppression.

To guard against anything, it is necessary to know the force and method in which it may come. The anarchist shows himself in the shape of the mob. The dealing with mobs, therefore, becomes the duty devolving upon the army in any civil commotion.

All communities have their lawless persons; their number increasing, however, in a ratio vastly beyond the increase in population. Especially do they congregate in large cities, where they band together and form at all times a formidable foe to the peace and security of the people. This formidability arises from many reasons. They are utterly irresponsible. They have nothing to lose, but all to gain. They have no property to forfeit. Their brains have one idea uppermost, "In pillage there is wealth." There is no moral restraint for them. Prison does not mean infamy. Probably the most disagreeable aspect that confinement presents is an elevation to a tone of morals many planes beyond their comprehension. Something as an average man might regard a remote monastery, so they regard state prisons. They do not fear work. Work they must—so as well in jail as out of it, they argue. It is exactly the same character as that which hovers about an army's march—out of sight by day, but after a battle coming upon the field for the purpose of robbing and stripping the dead and wounded. It is a character bad beyond ordinary conception. Their strength and minds are brutish, and they have miniature hells for souls. Famine, pestilence, and war, are truly their deities. There is but one thing they fear, and that is death, and in this fear lies their one weakness. In view of their character and their danger, the law becomes plain and its execution simple. "The Handling of Mobs" can be written in a volume briefer than its title. Mobs and their treatment present a problem of the uttermost seriousness. All classes and conditions of people in the United States are vitally concerned and should be interested in mob suppression.

No possible twist of the conception can conceive an army as presenting any other face to a mob than that of absolute hostility. When our army has been called upon in the past to act and take part in strikes, it has only been when rage has raised a mob to the crest of the labor wave. When this happens—down that mob must come, no matter what the cost in life and wealth. If not brought down—and speedily—from a murmur to a roar, from a roar to a hurricane, it will raise its song, and make a truth of its pleasant carol, "To hell with the Government."* Demoralization may reach a degree deserving the name of contagious insanity. It is seen in the panic following the retreat of a defeated army, or in the mad endeavor of an audience to escape

* The cry of the mob in Chicago in the summer of 1894.

from a burning theatre. In these cases fear and teror is the cause of demoralization. Exultant rage unrestrained will create the same degree of disorder. This is noted in the sack and pillage usually following the fall of a besieged city. Yet the demoralization resultant from any of the foregoing causes is as bland as peace in comparison with that state of delirium that comes upon a community in a mob's possession. History affords ample studies of mob rule both for longer and shorter periods. In the "Reign of Terror" witness the mob supreme! In Nero, Commodus, Caracalla, behold its darlings! Cincinnatus would probably have regarded the idea that Rome would ever reach such a condition as to make a Nero possible, just as our average citizen regards the idea that such a state may be reached by us. Yet the Nero came, just the same. None will ever know how near we were to a "reign of terror" in Chicago last summer except those who were near the scenes of trouble. All the material was there to make it, it only needed a Robespierre or a Marat to touch it off.

It may be said in conclusion that labor occupies the same status towards such an event as did the French Republicans towards their "Reign of Terror." By their disaffection mobs became possible; by their sympathy, protection, and encouragement they thrived. Their madness grew contagious, and France was for many years a moral wreck, needing to be ruled by military despotism.

Labor's attitude, if maintained as now, will force upon our country the very militarism it seeks to avoid. The combined influences and natural God-given powers inherent in the laws that must govern society—in the necessary existence of capital and government—will be found a force that will relegate labor back into slavery if labor attempts to pervert or defy the moral principles upon which its freedom is based.

If the laborer can see this; if he can throw off the mob-embrace and ask for protection from it; if he demand as much as any other class that strong laws maintained by strong force be erected to guard the life, liberty, and property of himself and other citizens, labor's condition is in a fair way to improve. But if he has an idea that liberty is the license to transgress these rights in others, and, not for their advancement and protection, then labor's progress will be towards slavery in that degree in which such opinion is held.

THE STORY OF A RESCUE.

By Brevet Colonel L. H. CARPENTER, U. S. A.

ABOUT the middle of September, 1868, my troop (H of the 10th Cavalry) was sent to take station at Fort Wallace, located on the western border of Kansas. The Cheyennes had broken out during the summer and devastated the line of settlements on the Solomon and near the centre of the State, but the troops after rapidly concentrating in that vicinity compelled the savages to retreat, and they were next heard of attacking travellers and trains on the roads farther to the West.

The garrison of Fort Wallace consisted of two troops of the 10th Cavalry and three companies of the 5th Infantry, under the command of Brevet Colonel H. C. Bankhead,captain 5th Infantry, a soldier of experience who had graduated in 1850 and had served in the Civil War.

Reports came into the post that the Indians were seriously interfering with travel on the road to Denver, that carrying the mail was dangerous and its delivery uncertain and unreliable.

On September 22d I left the post under instructions to proceed on the Denver road to where it was crossed by the Sandy Creek, about 60 miles from Wallace, and there establish a camp. From this point we were to scout in every direction and take measures necessary to keep off the Indians and protect the trains passing through the country.

In addition to H troop, 10th Cavalry—which was about 70 strong—there were attached 17 frontier men, who had been enlisted for the campaign ; a self-reliant and fearless party, under the leadership of Victor Clark, a dashing, handsome looking man, and a fine specimen of the frontier scouts who came into the service and figured prominently in the Indian campaigns which occurred soon after the war.

The officers who accompanied me were 1st Lieutenant Charles Banzhaf, and 2d Lieutenant L. H. Orleman, 10th Cavalry, with Dr. Jenkins A. Fitzgerald, of the medical corps, as surgeon.

As we were to go into camp for at least a month, thirteen wagons were furnished to carry the forage, rations, extra ammunition and tentage required.

On the evening of the 22d the command bivouacked near Cheyenne Wells on the road to Denver and early on the 23d resumed the march to the westward. We had reached a point on the old stage road about 45 miles from Fort Wallace, from which Pike's Peak could be seen and the range of the Rockies including Longs Peak and the mountains back of Denver, when a courier from the post, who had ridden all night, overtook us, bearing the following despatch:

Headquarters Fort Wallace, Kansas, September 22, 1868, 11 P. M.
Brevet Lieut. Colonel L. H. Carpenter, 10th U. S. Cavalry.
On Scout.

Colonel,

The Commanding Officer directs you to proceed at once to a point on the "Dry Fork of the Republican" about seventy-five or eighty miles north, northwest from this point, thirty or forty miles west by a little south from the forks of the Republic, with all possible despatch.

Two scouts from Colonel Forsyth's command arrived here this evening and bring word that he (Forsyth) was attacked on the morning of Thursday last by an overpowering force of Indians (700) who killed all the animals, broke Colonel Forsyth's left leg with a rifle ball, severely wounded him in the groin, wounded Doctor Mooers in the head and wounded Lieutenant Beecher in several places. His back is supposed to be broken. Two men of the command were killed and eighteen or twenty wounded.

The men bringing the word crawled on hands and knees two miles, and then travelled only by night on account of the Indians, whom they saw daily.

Forsyth's men were intrenched in the dry bed of the creek with a well in the trench, but had only horse-flesh to eat and only sixty rounds of ammunition.

General Sheridan orders that the greatest despatch be used and every means employed to succor Forsyth at once. Colonel Bradley with six companies is now supposed by General Sheridan to be at the forks of the Republic.

Colonel Bankhead will leave here in one hour with one hundred men and two mountain howitzers.

Bring all your scouts with you.

Order Doctor Fitzgerald at once to this post, to replace Doctor Turner who accompanies Colonel Bankhead for the purpose of dressing the wounded of Forsyth's party.

I am Colonel, very respectfully your obedient servant,
Hugh Johnson,
1st Lieutenant, 5th Infantry,
Acting Post Adjutant.

Having read this communication hastily I dismounted the command and proceeded to consider the matter. I knew Forsyth personally very well. We had served together in the Wilderness Campaign and in the Shenandoah on the staff of General Sheridan. After the battles of Winchester and Fisher Hill I accepted the command of a regiment of volunteers in the West and had not been thrown with him since. He was at the time of which I write a major in the 9th Cavalry and a brevet colonel, remaining on the staff of General Sheridan after the war.

We had heard at Wallace that he had raised a company of scouts under special authority and that he was operating somewhere to the north of that post, but had no further information regarding his movements.

Neither of the two scouts bringing word from Forsyth's party had been sent to assist in guiding me to the place where the fight had occurred, and I had nothing but the general direction contained in the letter.

The map in my possession was very unreliable as no accurate surveys of this part of the country had then been made. On inquiry I found that no man among the scouts had ever been through the country to the north, and in fact I doubt if many white men had visited that locality, as it was the camping ground and home of the tribes of the Northern Cheyennes and certain affiliated tribes of the Ogallala and Yankton Sioux, and it was not safe for anything less than a considerable force to venture in the vicinity.

A point "north, north-west" from Fort Wallace upon being protracted on the map, showed about north 10° west from my present position, and I finally concluded to take that course hoping for something favorable to turn up.

I also concluded to keep my wagons with me, as in the first place I did not wish to detach any men to escort them back to Wallace, then there was no other way of carrying the supplies required, and finally if attacked in the open by a large force of Indians, the wagons would serve as a fort.

Upon further consideration of the despatch it seemed probable that Bankhead had really no expectation that we would suc-

ceed in rescuing Forsyth, but had sent the instructions contained therein to carry out the general directions received from General Sheridan.

I could not help being impressed with this, because no guide had been sent who could conduct us and the order to return the surgeon, Dr. Fitzgerald, back to the post, so as to allow Bankhead to take Dr. Turner with him seemed strange under the circumstances.

As I had made up my mind to use every effort to help the beleaguered party in distress, it struck me that if attacked on the way, or if so fortunate as to find Forsyth and his party before others reached them, we would need a surgeon and would be nearly helpless without one. I had always been trained to obey orders without questioning, but in this case determined to risk the chances and retain Dr. Fitzgerald. The doctor clinched the resolution by expressing a great desire to go along. A glance showed the greatest interest and expectation on every face. The scouts had crowded around and the troops were on the "qui vive" as all felt certain that something unusual had occurred. Having explained to them in a few words the purport of the news and that we would have to make every exertion to relieve the party in distress, a cheer broke forth and we left the stage road and struck across the open country. To Lieut. Orleman was given the task of running the course upon which it was decided to travel, as he was very efficient and reliable in every way. The wagon master was told to keep his train close in rear of the cavalry column, and was instructed that if any of the mules gave out through weakness they were to be left and if necessary the wagon abandoned. However the mules seemed strong and in good condition and I judged that they would stand the distance we would probably have to make even if they were pushed considerably.

The gait was an alternate walk and trot, making about 5 or 6 miles an hour. We left the stage road nearly at noon and marched steadily over a rolling country, finding no difficulty in selecting a good trail for the wagon train. After travelling about 35 miles, when it became too dark to move we bivouacked for the night near some water holes. In the morning we started as early as possible and moved on the same course, for about 20 miles, when we arrived at a large and imposing looking dry river or creek, with a wide bed of sand. As my instructions described

Forsyth as being located on the "Dry Fork of the Republican," and as the map showed a South Fork, the Arickaree Fork and the North Fork, I could not tell which was the Dry Fork, and I was therefore afraid to pass this stream without a thorough investigation. I think this tributary is now known as "Dry Creek" on the later maps. We scouted up the creek about 15 miles but finding no result pushed on to the northward and at a short distance came to a stream with plenty of flowing water, in the midst of a wide grass covered valley, with hills on either side of beautiful meadow bottom lands. As we passed into the valley a large and fresh trail of Indians was discovered. At least 2000 head of ponies had been driven or ridden over it but a few hours before and the signs showed that large villages were on the move. The tracks indicated that the savages were travelling down the river, and they were so fresh that we were apprehensive that the hostiles were near at hand and that there was danger of an attack at any time. Influenced by this evidence a spot was selected on the banks of the river, so as to be sure of water, and the train corralled with the tongues of the wagons inward, so as to present a formidable obstacle in case the enemy should assault us. Having made all of the dispositions necessary to make an effective defense, I took a small party and rode to a high hill from which a good view could be expected. We could see far down the river but did not discover any moving object. Having surveyed the landscape, our attention was directed to several Indian scaffoldings erected on the hill, upon which bodies were placed after the Cheyenne method of burial, to keep them from the wolves. These scaffoldings must have had a new look, for something instigated a closer examination. A body was taken down, unrolled from the skins enveloping it, and it was discovered that the Indian warrior had evidently died from a recent gun-shot wound. Another was examined with the same result, and another and another. Five Indians all killed recently by bullet wounds. Every one was satisfied that these men had met their death in some fight fought at no great distance within the last few days, and as the Forsyth fight was the only one likely to have occurred, they had probably taken part in that affair.

Standing on the hill and gazing across the valley we saw something white in a ravine on the opposite side. This turned out to be a wigwam or tepee built of new freshly tanned white skins. Inside on a little platform lay the body of an Indian war-

rior, evidently a chief or man of consequence, wrapped in Buffalo robes. An Indian drum, similar to those used by the Indians for medicine purposes, a shield and some other equipments were placed at the head and feet. This chief had also been killed recently by a bullet wound. A scout sent down the river returned with a report that the trail was found to leave the river some miles down and lead across the country in a southeasterly direction toward the Beaver Creek, but that no Indians had been seen. The signs seemed to show that a large portion had remained in camp in the vicinity for about two days. We were convinced that the trail was that of Indians who had participated in the attack made upon Forsyth, and it began to look as if they had left after killing and scalping the whole party. As my mission was to find them, whatever might be their condition, I came to the conclusion that following the trail of the Indians would lead farther and farther away from the object of our quest, and that it would be better to take the back trail, and go where they came from with the hope that this would bring us into the vicinity of the scene of the late conflict, and give a chance of extending a helping hand to our friends if by good fortune we found any alive.

But the sun was down and we were compelled to pass another night before we could take further measures. Early in the morning and while we were packing up, some mounted men appeared on the hills to the south and rode rapidly towards us. We soon discovered that they were white men, and on their joining us found that it was a party of five, one of whom was a man named Donovan, one of Forsyth's scouts. Donovan and another had been sent out the day after Stilwell and his companion had succeeded in getting through the Indian lines. Stilwell carried the information which resulted in the efforts now being made for Forsyth's rescue, but Donovan, arriving at Wallace after Bankhead's departure, had collected four adventurous spirits and started out expecting to overtake him. Not knowing the trail, he had taken a wrong course, and by a wonderful piece of luck had happened on my command. I gathered from a talk with Donovan that the fork or branch that Forsyth was on was probably more to the north, and that the stream where we were was the South Fork of the Republican.

As we expected, the back trail of the Indians soon left the South Fork and led to the northward. It was evident that the main force of the Indians had gone to the eastward and we felt

there was little to fear. I took 30 men with me and the ambulance, leaving the remainder of the force and the wagons to follow under Lieut. Banzhaf. Some hard bread, coffee and bacon, were thrown into the ambulance to give immediate relief in case we found any of the beleaguered party alive. The Indian trail was as plain as a wide road and conducted us over a good practical country for wagons, generally the case with the routes laid out by the Cheyennes and Sioux. At all events their trails follow as good ground as the country will afford. Marching at a rapid gait for about 18 miles we came to broken and rugged ground, evidently the breaks of another large stream. Finally we came to a spur from which the country could be seen for a long distance. The ground fell away below us, and far down in a valley a large stream appeared running east and west. To the right the valley opened out and we could see what appeared to be an island in the midst of the river. Donovan recognized the place at once and said that was the island upon which Forsyth and his party were intrenched. We could make out moving objects near the island but too far off to distinguish them clearly. The ambulance was sent to follow a safer route and we then picked our way down the stream which was a dry bed of sand with here and there a little water on the sides.

As we clambered over the rough ground, we saw the men near the island run towards their comrades as if apprehensive of our character, but as we neared them they recognized us and received us with evidences of the wildest joy. I could not help noting the haggard, wolfish look on their countenances, which indicated hunger and starvation, but did not stop, rushing forward to where Forsyth was. He was lying in an excavation made in the sand, unable to move from the nature of his wounds. He maintained his nerve wonderfully, but was much affected when he saw me. I grasped his hand and told him that I was sorry to see him in his present condition, but was glad to be able to render him assistance.

The island was surrounded by rifle pits affording complete protection and connected with each other. The Indians had very little show against men intrenched in this way and they could have been reduced only by starvation.

It was high time that succor was given to the wounded. We relieved them on the 25th, the 8th day after the first day's attack and many had wounds which had not been properly dressed

for seven days. Forsyth had three wounds and Dr. Fitzgerald informed me that in his case blood poisoning had already commenced.

Banzhaf and the remainder of the command arrived with the train in a short time, and the tents were erected on a grassy spot, a quarter of a mile from the island, in order to get away from the terrible stench which filled the air from the dead horses which lay in a circle outside the trenches. As soon as the tents were in shape the wounded were carried to them and made as comfortable as possible. Forsyth's men were soon cooking bacon. munching hard bread and drinking coffee. One of them showed me a piece of horse flesh that he had cut off to use for his dinner that day, but it was so offensive that I could not bear it near me.

That night Dr. Fitzgerald amputated the leg of a scout named Louis Farley, who had been shot in the thigh, the ball breaking the bone. I assisted all that I could in the operation, but the poor fellow was so far gone that he could not stand the shock and died the following morning. Forsyth was wounded in the leg below the knee, the ball shivering the bone and making a comminuted fracture. The doctor thought the leg should come off, but its owner strenuously objected and after many weary months the leg was finally saved and has been, I believe, serviceable ever since.

On the morning of the 26th we began to wonder what had become of Bankhead. According to my letter of instructions it will be seen that he left Fort Wallace with 100 men and two howitzers about 12 o'clock midnight of the 22d, or about 12 hours before I left the Denver stage road, and with the advantage of having two of Forsyth's scouts to lead him directly to the objective point. In order to be sure, he had evidently gone north from Fort Wallace to the Forks of the Republican and then followed up the Arickaree Fork. Some scouts were therefore sent down the Arickaree to look up the missing troops. Shortly after I received word that they were at hand, and about 12 o'clock on the 26th Colonel Bankhead arrived with his column. He was not alone however. At the Forks of the Republican he had met Colonel Brisbin with two troops of the 2d Cavalry, who had been sent forward by General Bradley, and the troops of Colonel Bankhead and those of Colonel Brisbin arrived together, learning with surprise that Forsyth and his party had been relieved by our force 26 hours before.

Forsyth and the wounded men were conveyed to Wallace. The former lay in a critical condition for 3 months and I was informed by Dr. Fitzgerald that if medical attention had been delayed in his case 24 hours longer he would not have lived, as pyæmia or blood-poisoning had already set in.

The chieftain whose body was found on the South Fork of the Republican River was satisfactorily identified as Roman Nose, a famous Cheyenne warrior, the most prominent leader in the fight with Forsyth's party, and I brought back his medicine drum and presented it to the Historical Society of Pennsylvania.

The following despatch was sent by Colonel Bankhead relative to this affair to Department Headquarters:

Detachment U. S. Troops,
Dry Fork of the North Fork of the Republican River.
September 26, 1868.

Colonel Forsyth sends his love. He is badly wounded but will be able to travel to-morrow. Lieutenant Beecher of the 3d Infantry and Dr. Mooers died of their wounds and are buried.

Lieutenant Colonel Carpenter arrived here yesterday at 10 A. M. His promptness and celerity of movement deserve credit.

The scouts sent from Wallace I met on Beaver Creek, they having been driven back by the Indians. I started them again but they did not find the command of General Bradley, who did not reach the Forks until yesterday.

Forsyth's men fought desperately, the details of his fight I leave to him. His spirited and noble conduct encouraged his men. There are few cases on record of more desperate fighting and continued endurance without food, except horse-flesh, and surrounded by the dead and dying.

I cannot remove the dead but the doctors say I can remove the wounded to-morrow to Fort Wallace. Colonel Forsyth estimates the number of Indians at six hundred. He takes this estimate from the judgment of Sharp, an old and experienced scout. They were Cheyennes, Arapahoes and Sioux.

Lieutenant Colonel Carpenter reports that he struck the trail and place where they had encamped probably for two days after leaving here, and the trails show that they are going southeast towards Beaver Creek.

He found the bodies of five Indian warriors (Cheyennes) about 18 miles from Forsyth's camp, evidently some of the killed in the fight with Forsyth.

* * * * * * * * * *

I have the honor to remain,

Your obedient servant,

Henry C. Bankhead,

Brevet Colonel, Commanding.

After the campaign was over Colonel Forsyth was brevetted brigadier general for the fight on the Arickaree Fork of the Republican, and Colonel Bankhead was brevetted brigadier general for his energy in relieving Forsyth.

THE EFFICIENT HANDLING OF SEA-COAST ARTILLERY IN ACTION.

By Capt. H. J. REILLY, 5th U. S. Artillery.

SEA-COAST guns are efficiently handled in action when a proper proportion of the shots fired, depending upon the range, penetrate the enemy's cover, and by disabling his guns or ships, compel him to give up the attack.

In order to accomplish this result it is necessary:

1st. That the guns used shall be able to pierce the enemy's armor.

2d. That they shall have sufficient accuracy to hit the point aimed at.

3d. That the personnel shall be so well trained that the maximum number of properly aimed shots may be fired in the minimum time and

4th. That the guns shall be aimed so that the fullest advantage may be taken of their accuracy.

As there is no armored vessel afloat that can successfully resist the fall of a 12″ B. L. M. shell, filled with explosive, fired at a range of 10,000 yards; and as our 12″ B. L. rifles will pierce 20.6″ steel at 3500 yards, it may be granted that our armament fulfills the first condition, and is fully capable of piercing the protection of any vessel at any range at which her armament is capable of doing damage to the works of the defense, or to the personnel or material which they were erected to protect.

As at a range of 3000 yards for a target of 6 shots the mean deviation of the 12″ B. L. R. is 3.44 feet, and as the 8″ B. L. rifle has put 10 consecutive shots within a circle having a radius

of one and one-quarter yards at 3000 yards range, it may be granted that the second condition is fulfilled, and that the guns have the desired accuracy.

That the B. L. R. mortars have sufficient accuracy may also be granted as in a target of 10 shots fired at a range of 8000 yards 5 of them would have hit a war vessel of the size of the *Inflexible*. Besides, the method of using them will more than compensate for any unusual dispersion in their individual fire.

As it is a matter of organization and discipline and as it would make this paper too long to give it the full consideration which its importance would demand, we will also assume that the training of the personnel is all that it should be. There is therefore but the fourth condition left for consideration, viz., that the guns and mortars are so aimed that the fullest advantage is taken of their accuracy.

For aiming a gun or mortar accurately the first essential is a knowledge of the correct distance from the gun to the target and in indirect aiming the azimuth angle also.

In the case under consideration the fire of the defense will have to be delivered at a target consisting of a varying number of war vessels ranging from 5 to 10 per mile, depending upon the depth of water available within effective range; and as it would be suicidal for the vessels to anchor while subject to the fire of a properly directed defense, the target will, undoubtedly, be in constant motion.

As the channels will be obstructed by mines and other obstacles the vessels cannot run by and take the defenses in reverse. And as a determined attack will probably only be made in conjunction with an expeditionary force, the commander of the attacking squadron, when he feels sure that he has control of that portion of the sea and does not fear that he will be interrupted, will be desirous of making the best possible practice against the batteries, it may be granted that his speed will not exceed good steerage way—from 5 to 8 knots per hour.

With the long ranging artillery now in use it is not necessary, nor is it desirable, that the guns should be gathered in a single work in order that concentration of fire may be obtained, consequently the armament will be distributed in separate batteries, similar guns being grouped together; and at important seaports where the attack is most likely to be made we may expect that there will be as many as from 8 to 15 of these batteries.

In case of an attack the commandant of the defenses will undoubtedly assign to each battery the special object on which it is to concentrate its fire, therefore, in considering the method of aiming to be adopted we may reasonably take any one of these batteries as a complete unit in all that pertains to the most effective use of its armament; that is, it will stand in the same relation to the commandant of the defenses, and the other batteries, as a war vessel in a squadron does to the admiral and the other ships.

In the armament of the defenses we may consider three classes of guns which will cover the whole ground, these are: 1st. The B. L. R. mortars. 2d. The B. L. rifles 6, 8, 10 and 12 inch. 3d. The S. B. 8″ C. R. and rapid fire guns for the protection of the mine fields; the movable armament does not come within the scope of this paper.

For aiming the mortars a position-finding instrument, or a system which will give the range accurately up to 10,000 yards, and the direction of the target, is a necessity. Only with such an instrument, or system, fully developed, and with a personnel fully practiced in applying it, can that ideal fire control be obtained which is so well described by a foreign military writer, quoted by Major Hansard, R. A., who says, "it should enable the commander to hold, as it were, the mean trajectory of the guns in his hand, and direct a stream of projectiles on any point he may wish, with the same facility with which a gardener holding a hose can direct a stream of water drops on to first one plant, and then another."

Such an ideal is capable of approximate attainment, even with our system of horizontal base and squares, with which we are all so familiar, because as shown by Gen. Abbot's computations, since verified in practice, the fire of a battery of 16 mortars discharged simultaneously, will cover a space about 100 yards wide and 260 yards long so effectively at 7920 yards, that the *Inflexible* would probably be struck from 2 to 19 times per hour, firing the battery 6 times within that limit, that is, at the extremely slow rate of one round every 10 minutes.

The horizontal base has the disadvantage as compared with a depressive range and position-finding instrument, that it requires an observer at each end of the line, with the consequent difficulty of fixing them on the same object and obtaining simultaneous observations; it has also the disadvantage that plotting is neces-

sary to determine the locus of the target before it can be given to the gun.

The first disadvantage can be materially lessened, if not entirely removed by improvements in the system of communication. If the observers have the receiver attached to their ears as the operatives in a central station in a city do, and the transmitter conveniently attached to the azimuth instrument, they will then have both hands free and be able to communicate with each other, or the plotting station, without interference with the movement of the telescope.

To plat the target will require a board in the shape of a semicircle, with a radius of $4\frac{1}{2}$ or 9 feet, which should be graduated to at least 3 minutes on the edge, and have flexible wires from the stations to mark the intersections. As a base long enough to give good intersections can usually be obtained without difficulty the work would be sufficiently accurate for all purposes.

At Sandy Hook a base 9000 yards long was used in observing the range of the 12″ B. L. R. Where the vertical base cannot be obtained as at several places on the Atlantic coast this system will have to be used.

In England the Watkins D. R. F. is used and gives satisfactory results; it has the disadvantage that it must be placed far enough from the gun, usually about 200 yards and preferably on a flank, so that its levels will not be disturbed by the shock of discharge. An alternative position is prepared at the other flank of the battery, for use depending upon the drift of the smoke.

As a result of its position there is a difference between the ranges it gives and those from the gun to the target, which varies with the training angle of the gun and also with the distance. There are also variations due to changes in tide level. Corrections for both of these have to be applied in firing, in addition to those ordinarily made at the gun. Some of these instruments have had horizontal limbs added to admit of their use as position finders.

The Watkins position finders are similar to the range finder, but give the training angle as well as the range. They have automatic indicators connected with them, so that the position of the target with respect to the gun is indicated at the gun though the instrument may be a mile away from it. The observer at the instrument makes all corrections for aiming the gun, and he makes the prediction of the point at which the shot and target are to meet. In firing where the guns are loaded and laid according to

the range and training angle indicated, the group officer orders the switch put to fire and so signals; the group is then discharged by the observer, who pushes the button when the bow of the vessel and the cross hairs of his telescope are in line. Correction for the next round is made on the splash, using the flexible finger of the instrument. There is a disadvantage in this, that the correction may appear to be necessary by errors committed at the gun without the knowledge of the observer. In firing in this way the planes of fire of the guns in the group are parallel so that if a turret ship was moving head on, as she probably would, a certain proportion of the shots would be wasted. For example, if it was applied to a group of two 12″ B. L. R. which have 160′ between pintle centres, if one shot hit, the other would miss; with the vessel broadside on and a group of three guns there would still be a probable loss of one-third; although such vessels will not usually fight broadside to the batteries.

If by delay a prediction is lost, the time required to make a new one, and for the vessel to again reach the predicted point must elapse, so that it cannot be said that the system provides for firing the maximum number of properly aimed shots in the minimum time; nor does it provide for that concentration of fire otherwise obtainable, as where the position finder is used simply as a range finder, and the gun is laid directly on the target.

As to the accuracy of the Watkins position finder, one supposes it must be satisfactory or else it would not have been adopted. Concerning its application in practice Col. Richardson, R. A., gives us the following: "Group firing by prediction in which the position finding operator predicts a point which a target will cross, sets his telescope on that point, sends down automatically the necessary elevation to the group of guns and fires them by electricity if the target comes on the guessed spot, has been well described as a method of insuring inaccuracy of fire. Predicted fire is slow and uncertain; steamers towing targets at no great pace sometimes make several long runs without a shot being fired when real accuracy is sought."

It must be admitted, I think, that successful firing by prediction can only be obtained by long practice, and that for this reason it would be difficult, if not impracticable, to get good results with it from the new troops which would largely garrison our sea-coast defenses in case of war, a good reason why the permanent personnel of the artillery should be as large as practicable.

So far as I have been able to learn the Lewis and Fiske position finders are the most promising yet tested here. In the Lewis, differences of altitude, curvature, and normal refraction are automatically corrected for, and the variations of refraction are corrected for by raising or lowering the cross hair. From the report of the "Board for Testing Range and Position Finders" we find that the maximum absolute error up to 4000 yards is less than 1½ per cent. of the range for both these instruments, which is practically within the danger space of the guns. As the range increases from 4000 to 10,000 yards, that is as the danger spaces of the guns decrease, the errors of the position finders increase, and in my opinion the ranges are apt to become unreliable, as, for example, between 6000 and 7000 yards, for, although the minimum absolute error is less than a half of one per cent. of the range the maximum error is nearly 4 per cent.

In the bombardment of Alexandria the best shooting was done by the *Inflexible* and *Temeraire;* the *Inflexible* dropped a small buoy at a known range 3800 yards, and steamed up to it to deliver her fire. She had the most powerful guns in the fleet, 16-inch rifles, 1700 lb. projectile, and as she could choose her position, we may take 3800 to 4000 yards as the outside range at which a ship will probably engage: up to that range the position finder is of positive benefit as a range finder; beyond 4500 yards, in the present state of development, it is of doubtful value for use with guns; nor is it especially useful for mortars beyond 7000 yards. Between 7000 and 8000 yards, out of 7 observations, the errors of only 3 were within 260 yards, the limit of longitudinal dispersion of our new mortar batteries. There is very great difficulty in getting exact definition, with he short bases, at such long ranges; yet the results obtained are so promising that the Board of Ordnance and Fortifications recommends the formation of a Board to develop a method of using the instrument in actual service.

Our horizontal base system, which is practically "a system of coördinates limited to the centres of squares," as now used when applied to the indirect fire of B. L. rifles, leaves much to be desired, although better results can be obtained than with the position finder, inasmuch as it is more accurate, and concentration of fire is only limited by the number of guns which can be brought to bear on the target.

Conceive the dial to show the number of any square to the

group officer, his table gives the angles of elevation and training; he makes his corrections for wind and drift, and his gun is aimed for the centre of the square; he then notifies the observer, who fires when the bow and cross hair are in contact on the predicted position, the centre of the square.

Now take a war vessel of an average size of 100 yards in length by 18 in width; moving directly towards the gun, she presents the maximum target, and if her course takes her through the centre of the square, considering the danger space of the gun, she can be readily hit.

But suppose she was approaching on any line passing through either half of the square and 9 yards from the centre, there would be no hit. If the *Inflexible* had dropped her buoy on a line passing through say the right half of a square and 29 yards from its centre she could have steamed up to it, fired, and dropped back and have twelve yards on either side to veer in, without being hit except by accident, if the group officer was confined to the limited information given by the square system.

If the vessel was moving perpendicular to the line of fire and this side of the centre, she would be liable to a hit due to the danger space of the gun; but if she was on the far side of the centre she would be reached probably only by a ricochet.

Now conceive two lines to be drawn through the centre of the square perpendicular to each other; they would divide it into four smaller squares each fifty yards on a side; imagine these to be lettered a, b, c, d, commencing in the left-hand upper corner, and a much closer approximation to the position of a vessel would be given with minimum labor; for example, 47–35a on the dial would indicate that the point to be aimed at was in the left-hand upper corner, and that fifty yards increase in elevation range and twenty-five yards left deflection should be taken; this would bring the vessel within the danger space. In any diagonal course through the square this method would probably insure a hit, especially so when it is remembered that a large proportion, if not all, of the guns in the battery may be aimed so that their fire will be concentrated upon the indicated point. For example, take a battery of eight B. L. rifles, the dials show the number and letter of the square; each group officer gives his elevation and training angle and signals the observer, who fires his salvo; or if he wishes to keep up a continuous fire, and there are four groups in the battery of ten guns each, the first group is fired, the observer

takes two minutes to observe the fall of the shot, make his prediction, show the number and letter on the dial and fire the next group; then a group is fired every two minutes, and has eight minutes to reload. Or the battery may be divided into two groups and four guns fired at once; the second group being fired after an interval of two minutes. There would then be four minutes for the first group to reload and a well-aimed fire can be kept up. In any case with this or the depression position-finder, the predicted position of the target has to be far enough from the last plotted position to cover the time for plotting, predicting, communicating, laying, firing, and time of flight; the interval being measured in space depending upon the ship's speed.

But aiming and firing by prediction while admirable with the mortar batteries which are peculiarly adapted to it, in my opinion, should not be applied to guns where it is possible to avoid it. It seems to be regarded as a necessity with disappearing guns, and yet I cannot see sufficient reason why suitable sights for direct aiming cannot be devised for them; certainly the inventive talent which has given us our admirable disappearing carriages should not find the difficulties insurmountable. With direct laying, and accurate range-finders, the same result is obtained as if each gun had its own position-finder.

Of the matter of communication betweeen the position finder, or the plotting station, and the guns I have little to say, because, if in a city you can go to a hotel room and call for and get ten or fifteen different articles by simply putting a dial-hand opposite the name of the article—and let it be remembered that there are 200 or more rooms with similar indicators—it does not seem that there should be any difficulty in getting a suitable system for a battery.

When there are no instruments, or in case the instruments are not available, the range may be obtained in the old way by first firing one or more single shots to determine it, and then aiming and firing a salvo from the remainder of the group at an elevation increased or decreased to cover the time of the observation shot and the firing of the salvo. This method has the disadvantage of using one or more guns as expensive range finders, due to the cost of the ammunition, the time lost, and the decrease of battery power, owing to the reservation of some of the guns for the trial shooting. These disadvantages however would decrease as the range to the target lessened until finally they would disap-

pear altogether as the ships reached their fighting ranges, 1000 to 2500 yards. That it is a useful method experience has demonstrated, take for example the first attack on Fort Sumter where the *Weehawken* after firing 26 shots in 40 minutes—as rapid firing as may be expected from the turretted ships of to-day—was hit 53 times; the *Passaic* received 35 hits while firing 13 shots; the *Patapsco* received 47 hits to her ten shots, and the *Catskill* while delivering 26 shots was hit twenty times; the *Nantucket* having one of her guns disabled after the third shot, and having fired 12 shots out of the other gun received 51 hits. The admiral reported next day "no ship had been exposed to the severest fire over 40 minutes and yet in that brief period five out of the nine ironclads were wholly or partially disabled." Twenty per cent. of the shots fired at these vessels were hits; the range varied from 750 or 900 yards, according to different authorities, up to 2000 yards. This example is a strong argument for disappearing guns being sighted for direct fire, as no time is then lost in waiting for a prediction which may not be fulfilled.

This is opposed to the conditions existing to-day, but I believe that the guns and ships, the one to assail, the other to resist, stand in about the same relative position to each other now, as they did then, except that the greater accuracy of the modern B. L. rifles renders successful practice more readily attainable, and the battle-ships of to-day offer targets three or four times the size of the little monitors.

Rapid fire guns, that is, guns which fire 10 to 12 aimed shots per minute, need no assistance for their direct laying; they are their own best range finders, and it seems quite within limits to say, that in connection with a good glass they may advantageously be so used for the heavier guns.

One of the simplest and best methods of assisting in correct aiming is by the use of buoys placed at known distances, as prescribed, and cross bearings easily utilized by those familiar with the channels. There are also occasions and places in which the gas buoys used by the Lighthouse Department, which burn for three months continuously, may be of great assistance to gunners in connection with the azimuths on the new carriages, and traverse circles.

In case of dense fogs ships will not attack the batteries; if the submarine mines or obstructions are interfered with, Gen. Abbot tells us the point of interference will be electrically indicated,

which is all that is necessary to insure an effective result from the rapid fire guns, and the grape from the large S. B. guns.

In night attacks the electric lights make the conditions of aiming similar to those of day-time, at least sufficiently so, for the batteries to retain their superiority of fire.

I will not go into the details of the injurious effect of smoke upon aiming, as it would make this paper too long, and because it will have a more detrimental effect upon the aiming of the guns of the fleet than on those of the forts, as the latter will usually be so disposed, that no matter which way the wind blows some of them will always be clear of it; besides, any one of the position finders clear of the smoke can locate the vessels for the other batteries.

From the foregoing it seems to me that the following conclusions may be justly drawn: With the mortars at present, correct aiming depends upon the horizontal base system with squares.

That in all cases where there is a good vertical base, the position finder, when it is sufficiently improved so that the error will be within the area of dispersion of the fire of the mortar batteries, say 1 per cent. of the range, will be the preferable method.

That the method of aiming and firing B. L. rifles by prediction has little to recommend it, if it is not a positive disadvantage.

That all guns disappearing or otherwise should be sighted for direct laying in connection with an accurate range finder.

And that the use of mechanical appliances for determining range or position or indirect aiming does not do away with the nccessity for thoroughly instructed and trained gunners; on the contrary, their services are more necessary than ever before; and they require and should have the best possible instruments for each gun in order to assist in direct laying so as to secure the best results at the longest effective range.

THE INFLUENCE OF PERMANENT FORTIFICATIONS ON FIELD OPERATIONS.

By Lieut.-Colonel H. C. EGBERT, 6th U. S. Infantry.

TO discuss this subject intelligently let us first see what the term Permanent Fortification expresses in such a connection and whether it should not include more than permanent fortification as technically considered by military engineers.

"Fortify, fortress, fort and the like, are all derived from the Latin *fortis*, strong, and the idea conveyed by the word 'fortify' is that, by artificial arrangement, additional strength is bestowed upon one combatant over another: hence a rock, tree or bank of earth which, while sheltering a man from the missiles of his opponent, leaves him free to discharge his own, is the simplest form of fortification. From this we derive the definition of fortification as the art of strengthening, by works of defense, positions in which it is proposed to place troops so as to secure them from hostile attack. Such positions may contain within them towns, ports, etc., or may simply shield a field army. But the object to be reached is always the same and the works of defense are always so disposed round the position as to offer the greatest obstacles to the advance of the assailants, and, at the same time, afford the utmost shelter to the defender."

The technical division of the subject is into Field and Permanent Fortifications, both being governed by exactly the same general principles; that is to say, the geometrical rules that govern the relief, the height of any point above the plane of the site of the work, the various parts of which the work is composed, as the parapet, banquette, rampart, the berms, the ditch, scarp and counterscarp and glacis, and their relative dimensions, as compared to and assisting one another, the theory of direct and oblique fire, and the protection against enfilade fire, all these fundamental points and their conditions are governed by the same rules both in field and permanent works. When it comes to details, however, the difference is at once discernible.

Field Fortification is the art of constructing temporary works

by an army in the field for its own immediate security. It is natural that the idea of a field fortification in the minds of those who participated in the Civil War will always be the fence of logs breast high, protected in front by the earth dug out of a shallow ditch behind it. This unquestionably, though a rude, was a very effective parapet especially considering that we moved every day or two to some new place, where we again fortified, but if time and knowledge and a more permanent occupancy had justified more care and labor, these works might have been on a regular plan with all the essential parts, and strength to protect the troops from both artillery and musketry fire. The straight lines might have been expanded into lines of redans or tenailles or even of bastioned fronts, and strengthened by redoubts and traverses without at all losing their character of being strictly field fortifications.

Now technically considered Permanent Fortifications differ from Field in the massive construction, in the great extent and intimate connection of their various parts as affected and compelled, that is rendered necessary, by this solidity and bulk of materiel and the tremendous force and range of modern ordnance. These permanent fortifications with the modern warships, almost equal in matters of war the enormous cost of the great civil works, the reservoirs and aqueducts of great cities, the canals and the great bridges of our age. Their cost with their great iron towers and iron fronts, and immense guns, rises easily into the millions, and this, whether we consider the bastioned fronts with which most of Europe is fortified, and to which the increase of artillery penetration and of indirect fire has compelled the addition of a most bewildering chain of massive outworks, or the polygonal system now coming so prominently into favor with its enormous ditches and complicated inner defenses; when it is remembered that one heavy modern gun with its disappearing apparatus and iron shield costs about $20,000, it will be seen that only the wealthiest nations can afford many modern fortresses.

From this brief recapitulation of the points of difference between field and permanent fortifications technically considered, it will be seen that neither class fulfills the definition of Permanent Fortifications required by our essay, and this for the reason that the increasing size and number of cities important in war, and the change from horse to steam transport have combined with the

greatly increased rapidity and scope of musketry to necessitate a number of fortifications of a composite order partly made up of detached, heavy, permanent forts supporting and connected by long infantry field works, in rear of which run the main infantry fortified lines. These series of works are most important to a modern state with its immense and partly drilled levies, and in virtue of their permanent forts, and still more of the intention of permanency accompanying their construction, are correctly included in the term Permanent Fortification as we have here to deal with it.

Having given our definition of Permanent Fortifications we proceed to examine three preliminary points which gauge their influence on Field Operations. These are: 1st. The object of the campaign. 2d. The character of the commanders. 3d. The relative force of the two combatants, force here including number of men and of guns and amount of materiel of war and the quality of the troops. The amount of subsistence supplies available and whether the country to be invaded is rich enough in resources to furnish the bulk of these is also an important point but not vital like the other three. It is to be remarked that the entire subject properly divides itself into two sides, *e. g.*, the influence of these fortifications on the field operations of the assailant and also of the defense; but the limits of my article will confine us to the former as the more important, the campaign of the defense being naturally marked out and mainly conducted on the lines dictated to it by the movements and selection of the assailant.

Briefly sketching the effect the *object* of the campaign has on the influence of these fortifications we see that in some campaigns that influence is paramount and controlling, as for example, where the main object of the campaign is the capture of the fortification and its garrison. Here the fortification truly fills the part of Hamlet in the play. Without the existence of the fortification there will be no such campaign, the forces employed and amount of siege materiel needed are in direct proportion to the defensive strength of the work, the number and strength of its garrison, and the composition, energy and position of its covering force if there be one.

The campaign ends with the capture of the place, subsequent movements being confined to the pursuit of such portions of the garrison as may escape. There are quite a number of brilliant examples of this kind of campaign, notably the capture of Ulm

by Napoleon in 1805, in which his marvellous combinations resulted in the simultaneous arrival of a number of small armies by different and widely divergent routes at the same time on the point to be besieged with all the effect of a surprise and its accompanying element of great loss of moral force by the defense from the beginning of the siege.

Another example is, we believe, the only military operation of importance occurring in Europe between the battle of Waterloo and the Crimean War in 1854. This long, almost unexampled period of peace, due in part to the exhaustion of Europe and to the terrible example of too much war, was broken in 1832 by the siege of the great fortification of Antwerp. A moment's divergence from our subject to explain the cause of this curious breach of Europe's long peace may be pardonable. In 1815 the Allied Powers formed Holland and Belgium into the kingdom of the Netherlands as a barrier against future French aggression. The two states, dissimilar in habits, religion, and pursuits, could not live in harmony, and in 1830, on the occasion of a revolution in France, the Belgians revolted.

A conference of the great powers was at once called to preserve peace, and the two countries received separate governments. The old Dutch General Chassé, however, refused to surrender the citadel of Antwerp; whereupon the English fleet blockaded the coast and a French army of 66,000 under Marshal Gérard advanced to the siege which began November 29, 1832. Antwerp is a first-class fortress and intrenched camp capable of holding 25,000 men, but Chassé occupied only the citadel and its outworks, his force amounting to 4500 men. The siege was conducted in due form and on December 23, a breach capable of admitting a column of 100 men abreast having been made in the main wall, an assault was ordered for the following day but the garrison surrendered.

A third instance is the siege of Vicksburg in our Civil War, you are all familiar with the details. The ultimate object of the campaign was of course the opening of the Mississippi, but this could only be effected by the capture of Vicksburg and Port Hudson. The character of the works was mostly earthen, but the intention of the Confederacy was undoubtedly to make it a great permanent post, and the position of the batteries on Yazoo Bluff gave them all the advantages that masonry work and intricacy of defenses could possibly afford to any less favored position.

This siege admirably illustrates the action of the assailant in beating off a covering force.

Again, let us suppose the object of the campaign is to be the acquisition of a province, naturally the first move of the assailant after beating away the field force immediately defending the province, will be to lay siege to any permanent fortification or fortifications that may be in that territory. Thereby he obtains a base upon which to act in retaining possession or in pushing his advance beyond its limits, if necessary to defend his conquest by further aggression, and the further advantage that should peace be suggested by third powers or asked by the assailed party, the assailant is in the most favorable position of being in possession of the strong places of the coveted province. There are noted illustrations of wars for the possession of provinces connected with sieges of their permanent fortifications in the early wars of Louis XIV. In his first Silesian war after the victory of Mollwitz in 1741, Frederic the Great turned his attention to the acquisition of all the fortified places of that province, the result of which was that, in all his after reverses, no preponderance of force was sufficient to wrest the territory from his assured grasp. All the above examples however may be classed as exceptions. Usually a war is declared with the view of righting some grievance or for the establishment of some principle or right. The campaign then is to be concerted on more general principles, the question of the influence of fortified places becomes in consequence, itself general and will be treated further on in our general discussion of the subject.

The second of the three points we have mentioned as greatly affecting the influence of permanent fortifications on field operations is the character of the commanders.

In the above cited cases of limited campaigns where the object is the capture of a fortress or a province, the action of the attacking commander is naturally limited to that object, but in a more general campaign there will be the greatest difference between the influence exerted by strong places on a great and on a mediocre commander and again between the effect they produce on a great commander whose forte is aggression and on one more prudent and circumspect.

For example a well-instructed and skillful general of moderate talents and with sufficient force to warrant an invasion will be most likely to form his plan first for meeting and overthrowing

the field army of the defense. He will then move upon the first fortress the position of which threatens his subsequent operations and proceeding according to the general understanding of the art of war, will lay siege to and capture it, and any other similarly situated fortresses and fortified towns. No other course will suggest itself to him nor would any other be a safe one to be followed by a general of moderate abilities. The same plan is likely to be favored by the great commander who has the bump of caution largely developed, or in other words, whose talents lie more in the plane of the defense than in that of the attack. On the contrary, the great leader who is naturally aggressive, will, after beating the field army, have laid his plans for following up his advantage safely by masking the fortifications in his path or by so laying his routes of advance or so shifting his base and line of communications that he may securely neglect the fortifications and pursue his course of conquest without the delay of sieges. This is most difficult to plan—more so to execute, but it is to be remembered that the great offensive geniuses of war—the great conquerors—plan and carry out combinations impossible to be originated by the majority of well-informed and able strategists, and in the execution of which ordinary men would ridiculously fail. Co-equal with their ability to plan remarkable combinations sits the more important fact that for the execution, fortune yokes herself into the chariot of the great warrior and actually drags him over his prostrate enemies.

The third preliminary point to be considered before fully encountering our subject, is the relative strength of the combatants, of which it may be briefly said that a commander whose forces are greatly superior in numbers or armament or moral force, may plan a campaign vastly more free from the consideration of fortified places than one whose resources are comparatively equal, that is, have only the superiority absolutely demanded by the offensive. Great superority will enable a general to spare sufficient force from his main army to besiege a fortification in his path and thereby to blot it out of his calculations of the great results. It will also permit him to make diversions at a point far distant from his real line of invasion—thereby compelling the defense to draw off all covering forces. The same condition of affairs exists when the shock of battle has resulted so disastrously to the defense as to make the assailant physically and morally overwhelmingly superior. He can then recast his plan

of invasion and make it conform to that of a power originally possessed of that superiority. This to a certain extent was the case in the Franco-German War of 1870. The early operations resulted in so largely increasing the superiority of the Germans in numbers, morale and resources, that it enabled Von Moltke to proceed immediately with a plan of campaign impossible except under conditions of great superiority of the offensive over the defense. That he did make this change of plan appears to the writer an undoubted fact and further that he changed the ulterior purpose of the campaign from the simple occupation of Alsace-Lorraine to the capture of Paris.

When, on the contrary, the force and resources of the combatants are not very dissimilar a much more equal game is presented, the principles of war have their fuller play, and must be much more strictly considered and their demands deferred to, and the question of the influence of strong places on the campaign resumes its proper proportions.

Having now cleared the subject of considerations that restrict it and may be looked on as particular cases forming exceptions, we are free to enter on its general discussion.

The officer or group of officers charged with the preparation of the assailant's plan of campaign, is provided with a sufficient but not overwhelming force, and fully informed as to the geographical and topographical conditions of the defense and knows generally its resources. Depending upon what country is to be attacked these officers find themselves confronted with one of three conditions, *e. g.*, 1st. A country where only the naval ports and naval arsenals are in posture of defense. Such is the case with England at present, and will be the case with the United States when the works recommended by the mixed board some years ago and now under construction are completed. The plan is much more extensive than the English, as it includes all of our chief seaports (though by no means all of our harbors) and is to cost $125,000,000. 2d. A country in which both naval ports and the frontiers are fortified. Such, with the important addition that Paris is most extensively fortified, is the case with France, where all the naval harbors are strongly defended by great works and where the German frontier is protected by a line, and in some points a double line of forts so closely connected that passage is practically barred unless the chain can be broken by the capture of one or two links. The Belgian and Swiss frontiers are

by no means as strong, but there are large forts and fortresses on both. 3d. A country in which the harbors and frontiers being fortified, though not necessarily in so complete a manner as France is towards Germany, the capital city would also be in a condition of defense and at least one entrenched camp would be provided in the interior of the country. If in addition one or more of the most important cities distant from the capital, such as Orleans and Bordeaux in France, and on great lines of communication were permanently fortified, a complete system of defense would be presented sufficient to secure a country from any but most overwhelming odds, and offering a most exacting problem even then to the staff of an assailant.

As an example of the first condition we have said that England has her naval ports strongly defended, those in which her ships of war are built and repaired and her fleets fitted out and supplied; but her chief seaports, London and Liverpool, are without defenses, relying upon the command of the seas by the British navy to defend them, and for this she spares neither money nor work. In the present condition of absence of interior defenses, the action of an army making a successful landing in England is plainly marked out. Just as soon as the troops were at all on their legs the advance would be made on London by the shortest roads. The capitulation of that capital would at once attend upon their arrival, provided a sufficient force had been landed to overcome, in the open field, the regular troops in England and such volunteers as could be assembled in the few days available. These latter troops although well armed and equipped would be unorganized and unaccustomed to act in concert, and fighting in the open, would be at great disadvantage in conflict with a solid machine, well oiled and in perfect working condition. It would seem that the chances would all be in favor of the invader, because, while small bodies of partially organized troops, actuated by patriotism, have not seldom successfully met the most admirably trained forces, no case is remembered where, in a battle between armies of any size, the badly organized force was not turned and defeated. While frequently the battle is bravely sustained for awhile, the time soon comes when, in some part, signs of disintegration appear, and the leaders, being unable to bring fresh troops rapidly to the decaying point, the crevasse widens and widens till all is swept away in confusion. The rout of the field army would be followed at once by the sur-

render of London, which would end the war, provided of course that the invader were not so foolish as to demand terms amounting to a virtual dissolution of the British Empire.

Efforts have, for many years, been made by military men and prominent civilians to persuade the British people to fortify London. So far, relying perhaps on the superiority of their navy, they have resisted all appeals, but no stronger illustration of our subject could be given than the difference between a campaign in England such as we have outlined, and one attempted by the same force, with London fortified. It is not known that any formal plan for this purpose has ever been submitted, but it would undoubtedly include such permanent exterior forts as would enable an inferior force, in trenches, to compel an assailant to resort to partial siege approaches. Now to begin with, this fortification of London would by itself prevent any serious consideration of an invasion of England, as the force required to give credit, that is a military standing, to the enterprise would be too large to be spared or transported. But supposing the attempt to be made and with the largest force that could possibly be landed, it would be madness to sit down to the siege of fortified London and give time to the levies of 28,000,000 of people to form and solidify at leisure and undisturbed. The besieger would soon become the besieged. The only course left open for the invader on landing would be an imitation of Hannibal; to march past the city, and spreading in detached columns over the west and north, put the great manufacturing centres to heavy ransom, doing, no doubt, great damage to the resources and warlike reputation of England, but leaving in their rear fortified London with its large garrison as a permanent base and nucleus, from which would soon issue a force competent to cope with the invader. As this force would be constantly receiving accretion from abroad and at home, while the enemy, cut off from reinforcement, would, even without battles, be daily diminished by the numberless petty drains on all humanity, the failure of the expedition could only be a matter of time. This would seem to be a forcible illustration of the vast influence of fortification on a field operation of great proportions.

To turn to the United States, as perhaps the only other great state all of whose fortification is intended to be exterior, our numbers, warlike spirit and resources, would, when these defenses are completed, render an invasion both morally and physically an

impossibility, except by a combination of two of the strongest sea and land powers of the world—for example, England and France, or England and Germany. Either one of these combinations would hold the command of the sea against any other one power —almost against any other combination of powers. It could therefore land a large, fully equipped force, in any of the good harbors of our eastern coast too numerous to be fortified, and yet within a reasonable distance of New York, now, next to London, the largest and wealthiest city of the world. In this case the fortified harbors of the country could have only a secondary influence on the campaign, the object of which, would of course, not be permanent conquest, but the levying of enormous contributions on our cities defenseless on the land side, the diminution of the prestige of the great Republic, and perhaps the abandonment of the Monroe doctrine and of any claim to control the Inter-oceanic Canal. The immediate objects of the campaign would be the capture of the foundries and arsenals of the east, and of the city of New York, to be followed if the terms of the invaders were rejected, by that of Philadelphia and other seaboard eastern cities, all of which must necessarily fall unless a land army could be organized and armed in a brief period, of strength to check the assailant. How long the forts in the harbors could hold out would depend on the proposed strength of their defenses on the land side, the plans for which have not been made public, but their usefulness while in our hands would be limited to the sheltering of our fleets and privateers, admitting warlike stores from abroad, and defending the construction of new warships. It is not necessary to dwell on a condition of affairs distressing to the patriot and humilitating to the professional soldier of the Republic, longer than to point out the ounce of prevention which is better than the pound of cure. In enumerating the essentials of an invasion we have mentioned "a large and fully equipped force."

The war in the east has shown how easy it is to land on a neighboring shore, an army or succession of armies aggregating 150,000 men, but to transport such a force across the Atlantic would be a vastly more difficult undertaking, and would scarcely be attempted. There is however always a point in military undertakings up to which all probabilities move together towards success in the operation but beyond which the chances of failure increase in almost geometrical proportion. This, on examina-

tion of the carrying capacities of modern steamers and many other most important items, we estimate at about 100,000 men. Now while a force of this size, composed of picked officers and men, with all modern equipments and under a resolute leader, is a most formidable engine of war for a brief campaign, its inadequacy to contend against the resources of the Republic with abundance of time for preparation is admitted. But that is not the question. It is our habit as a nation to be always unprepared on land for danger, and it is in view of this chronic condition of the body politic that the suggestion is ventured of three precautions, the adoption of which is possible, practicable and comparatively inexpensive. The first of the three is, that somewhere in the valley of the Mississippi, this being a safe distance from the Atlantic coast, there should be collected, in care of the army, a quantity of rifles—perhaps 200,000—with field guns and the necessary amount of ammunition and supplies for both classes of arms.

The second point is that the regular force should be raised, as in the near future seems probable, to 40,000 men of all arms. The third precaution against such invasion and perhaps the most difficult of attainment is that the National Guard of the states within two days' journey of the Atlantic coast should be raised to the standard in numbers of New York and Pennsylvania proportionally, and be encouraged and instructed to attain in equipment, discipline and morale the condition of a permanent force.

With the railway facilities of the United States, it would then be practicable to assemble a force of size and quality sufficient to meet the invader in the open, and able perhaps to defeat him, certainly to so shatter his strength as to destroy all prospect of success, which to be possible must of necessity be speedily decisive.

OUR PRESENT ARTILLERY ARMAMENT—1894-95.

By 1st Lieut. WM. E. BIRKHIMER, 3d U. S. Artillery.

MY mind, in retrospect, goes back to the occasion, in 1872, when, at the Artillery School of Practice, I had for the first time the pleasure of listening to a lecture by General William F. Barry, upon United States Artillery. It is with peculiar satisfaction that we can contrast the present with the then condition of artillery affairs. At that epoch we had but lately passed through a protracted and gigantic war, in which our sea-coast artillery had been raised, for that day, to a high pitch of perfection. So far, however, as sea-coast armament were concerned, it was smooth-bore almost entirely, of which type the 15-inch gun was the model. The few 20-inch smooth-bores constructed were looked upon as marvels of professional skill. It is true that the rifle principle, as applied to artillery, was then forcing recognition, but during the stirring and exacting times of hostilities, there was no opportunity to apply it generally to the higher natures of sea-coast ordnance. Soon after the War of the Rebellion was successfully closed, the general government began to turn its attention to the serious problem of rifling all its newly constructed artillery. It was seen that the days of smooth-bores were numbered. At the time General Barry delivered his lecture the whole subject of a proper armament was in a state of transition. For many years this continued, and no man was wise enough to foretell the result. The authorities felt their way from year to year, experimenting on their own account and gathering wisdom from the military nations of Europe. From all this we have to day no longer a merely tentative, but a deliberately adopted system of artillery which compares favorably with that of any other nation, and what is of equal importance our own manufacturers can make them. When General Barry delivered his lecture he stood looking into an artillery future which neither he nor any other could penetrate. He passed away before that future was developed; but we, more fortunate, have lived to see the clouds of doubt dispelled, and our country, without having been caught unprepared, buckling on the complete armor of defense.

The guns, mortars, etc., constituting our accepted system at the present time, together with some of their most important characteristics, have been officially announced, and are set forth in the table on opposite page. The system is, without exception, breech-loading, of steel and rifled.

It were almost, if not wholly, profitless to institute comparisons between the artillery existing and the ancient order of things even so near as 1872. Yet we have retained, in the sea-coast armaments, some of the old smooth-bore pieces, particularly the 15-inch gun, and it now is being mounted at numerous of our fortifications. In Captain Ingalls' work on direct fire it is shown that, with the same initial velocity, the 8-inch breech-loading rifle projectile would have at 3500 yards, or two miles, the same velocity that a 15-inch solid shot would have at the distance of 1000 yards. Herein we see epitomized, in this important particular, the relative efficiency of the old and new systems.

Firing each of these pieces with its usual initial velocity, namely, 1700 f. s. for the 15-inch gun, and 1850 for the 8-inch, their projectiles have equal energy at the distance of 1950 yards, say one mile, and thereafter the energy of the elongated projectile gradually gains on the other until both come to rest. The 15-inch smooth-bore might do very well to defend the entrance opposite to St. Augustine, because the craft that could enter could not be such as would carry large guns. It has been retired to this subordinate rôle.

One feature of this modern armament which strikes the eye on examining the preceding table is the enormous weights of the guns. The new 8-inch breech loader does not weigh quite so much as the old 15-inch smooth-bore, but the 12-inch weighs over twice, and the 16-inch about six times as much. To traverse and otherwise manipulate these machines will require mechanical appliances superior in construction to those heretofore employed. This has been attained through improvements in carriages, some of which will be mentioned hereafter.

In the early days of rifled artillery the charge weighed about one-tenth as much as the projectile, or perhaps a little more. Now for the smaller natures, the proportion is about one-fourth and for the higher about one-half. This, for the kind of powder contemplated in the table. If, however, smokeless powder be used, it seems that the weight of the charge can be reduced—using the same powder-chamber, about 50 per cent. without reduction in

GUNS, MORTARS, ETC., CONSTITUTING U. S. SYSTEM.

Weights, Dimensions, etc.	MOUNTAIN ARTILLERY.		FIELD ARTILLERY.				SIEGE ARTILLERY.			SEA-COAST ARTILLERY.						
															Mortars.	
	Hotchkiss 1.65 in.	Hotchkiss 3-in.	3.2-in. Model, 1885.	3.2-in. Model, 1890.	3.6-in. Model, 1891.	3.6-in. Mortar Model, 1890	5-in. Model, 1890.	7-in. Howitzer Model, 1890.	7-in. Mortar Model, 1892.	8-in. Model, 1888.	10 in. Model, 1888.	12-in. Model, 1888.	12-in. Model, 1891.	16-in. Model, 1892.	12-in. Hooped	Steel 12-in.
Weight-lbs	121	218	829	805	1181	244	3660	3710	1732	32,480	67,200	116,480	127,680	280,000	31,920	29,120
Length of bore—Calibres	25.33	13.48	26.0	25.2	23.5	5.19	27.0	12.67	7.0	32.0	34.0	34.0	37.354	35.0	9.0	10.0
Number Grooves	10.0	24.0	24.0	24.0	26.0	20.0	30.0	42.0	28.0	48.0	60.0	72.0	72.0	96.0	68.0	72.0
Weight Charge	5.503	14.003	3.5	3.5	4.1875	15.0	12.5	10.0	5.5	125	250	450	520	1060	80	105
Weight Projectile	1.95	12.	13.5	13.5	20.	20.	45.	105	125	300	575	1000	1000	2370	*800 1000	800 1000
Kind Powder	Mortar	Granular	Sphero hex.	Sphero hex.	Sphero hex.	Spero hex.	Spero hex.	Granular	.....	Brown pris.	Brown pris.	Brown pris.	Brown pris.	Brown pris.	Brown pris.	Brown pris.
Length of Projectile in calibres	3.5	3.5	3.0	3.0	3.25	3.25	3.0	3.0	3.6	3.5 4.5	3.5 4.5	3.5 4.5	3.5 4.5	3.5 4.5	3.0 3.8	3.0 3.8
Muzzle Velocity	1298	870	1685	1685	1550	650	1830	1085	690	1950	1975	1975	2100	1975	1020	1140
Penetrate Steel at 2500 yds							3.0	2.7		11.9	16.	20.4	22.3	29.2		
Penetration Steel at 3500 yds							2.5	2.4		10.6	14.6	18.7	20.6	27.5		

*1000 lb. shell, with reduced charges, used up to 2½ miles; 800 lb. shell for greater ranges, maximum charge.

the energy or obstacle-destroying properties of the projectile. But it is to be observed that, thus far, the use of smokeless powders in guns of high power, has not been satisfactory. We are, therefore, as to these, constrained to accept the data given in the table, based as they are upon experiments with stable powders.

It is believed that ordnance of the natures mentioned in the table, except the 16-inch gun, have been manufactured and subjected by the Ordnance Department to practical tests. Failures to attain to standard or expected results have been due not to defect in the guns or other pieces, but to powders and carriages. The 16-inch gun is, with us, at this time, a purely theoretical piece ; but all the details of construction are worked out, and no doubt it will speedily be built when proper facilities are afforded. Regarding the ballistic qualities of these various styles of ordnance, it is matter of just pride to the artillery that, to the labors of one of their own members is due the placing in possession of the arm tabular facilities for calculating all necessary ballistic data with ease and accuracy. Reference here is made to Captain Ingalls' labors in simplifying the solution of problems of direct fire. Without going into his more elaborate work used as a text-book at the Artillery School of Practice, officers will find that his Artillery Circular, F, published for the use of gunners, while, as a rule, wholly beyond the attainments of the latter, is yet a most valuable treatise for the use of the officers themselves.

If we were to place the finger upon that feature of the existing armament which shows its superiority over preceding systems, we would find it in the power of the projectiles to penetrate steel at long distances; for by this is measured their destructive effect against vessels. The penetrating power of the smooth-bore guns was very little; they effected their purpose by racking to pieces the object struck, but this would be practically harmless against modern ironclads. Not so the rifle-guns. We see that their power to penetrate steel, the shots striking normal to the surface, at 2500 yards, or a mile and a half, ranges from 3 inches with the siege gun, to 30 inches with the 16-inch gun ; while, under like conditions, at two miles distance, these penetrations range from 2.5 to 27.5 inches. The accuracy of these guns is well established; so that, to render them formidable, only skillful gunners are necessary, presupposing, of course, that all needful accessories, such as carriages, powders, etc., are forthcoming. Nor is this accuracy confined to guns alone; the mortars, too, have this quality; and

hence the latter have become, as illustrated by the group-mortar battery recently tested at Sandy Hook, one of the most formidable weapons in our armory of national defense.

Such is our armament to-day, so far as concerns the shooting or projectile part ; but this is only one feature of the system ; another, and almost equally important, relates to the carriages upon which the ordnance is to be mounted, and by which alone their service can be rendered efficient. These two elements, the gun and the carriage, are the necessary complements of each other in the perfect artillery system. But whether it was that the gun was deemed the more important, and therefore more attention was given to it, or whether the solution of the carriage problem was the more difficult, it is a fact that, with us at least, the gun-problem was solved long before the latter. We now possess numerous modern guns, but few proper modern carriages upon which to mount them. But here again, thanks to the energy and ability of our ordnance officers, the supply seems nearly to be timed by if not equal to the demand. The Buffington-Crozier carriages for the 8-inch and 10-inch sea-coast guns have proved so satisfactory that, after severe tests on the proving-ground, the manufacture of a number has been contracted for. It is understood, also, that the tests of the Gordon carriage have been successful ; and we may, between these two, hope to have the 8-inch and 10-inch guns that now are being turned out, appropriately and efficiently mounted. The same is true of the mortars, the mounting of which, however, seems to be a question of less difficulty. Nor are our ordnance officers alone left to grapple with the carriage problem.

The minor problems to be solved in connection with the revising our present armament, such as powders and projectiles, while important, yet their solution, compared with that of the gun and carriage, seems to be easy. We will therefore, on this occasion, pass them by. Before leaving the subject of carriages, however, it is proper to state the condition, at this time, of this branch of our armament. There are now (January, 1895) being manufactured the 12-in. barbette, 12-in. gun lift, 12-in. casemate, with 10-in. and 8-in. both barbette and disappearing carriages. Of these, the 12-in. carriages are adopted ; the 8-in. and 10-in. carriages, barbette, are adopted, while the disappearing carriages for these guns may be said to be in the type stage ; that is, types have been successfully tried, but the pattern is not yet adopted, although in case of necessity the types would be duplicated as

rapidly as need be, but it is probable that some minor modifications will be added.

We thus are approaching the time, mentioned in the first annual report of the present Secretary of War, when our facilities for defense will enable us to protect from hostile fleets the great commercial and strategic centres on our extensive maritime frontier. As artillerymen, nothing could be of greater interest than the satisfactory solution of this great problem of sea-coast defense, in which it is our duty to play the first and important part.

It is interesting to note, and it is hoped that it will not be considered foreign to the subject-matter of this paper to review briefly the origin and progress to the present day of the system of fortifications in which these armaments are to be utilized.

The small works thrown up prior to the War of 1812 on our coasts were cheap and temporary affairs. The nation was young and poor. Military preparations and expenditures were hateful to the people. The engineers of the earlier days, prior to the advent of Mr. Jefferson's administration, were principally Frenchmen who were mustered out of service by that executive. The War of 1812 found us almost denuded of fortifications, and these of inferior construction, built wholly without regard to any general plan. The result was that our coast was ravaged with impunity by the enemy. The hapless militia, worn out by interminable marches hither and thither, to meet threatened or real attacks, became dispirited and their employment ruinously expensive. But that was not the worst of it; neither the militia parades nor the expense incurred did any good. A permanent lodgment was made by the enemy on the coast of Maine; Hampton was taken and plundered, the national capitol taken, sacked, and partially burned; and these were but isolated instances of the general plan of freebootism successfully practiced by the enemy.

These events profoundly impressed and sank deep in the public mind. Fortunately for the nation the first President elected after that war closed, James Monroe, had acted, in the capacity both of Secretary of State and Secretary of War, a promineut part in the administration of affairs during that one-sided struggle. Equally fortunate was it that a man of genius—John C. Calhoun—was appointed by him Secretary of War. A proper system of sea-coast fortifications became at once the rallying cry and central principle of Mr. Monroe's administration. In eight

years these two may be said to have run the Government, and, when they went out of office, the practice of Congress giving large (relatively) appropriations was so well established, and the public mind had become so educated to the necessity therefor, that no subsequent administration, at least for many years, interposed to obstruct the construction of the numerous fortifications that were being erected upon an intelligent, well-digested plan.

President Monroe went about this work with consummate ability, and the foresight of a true statesman. General Bernard, one of Napoleon's ablest military engineers, was induced to take service with us. He was not an abler man than MacRea or Totten, and perhaps others of our own engineers, who were associated with him. But he had what, to the same extent, they had not—experience—and for this reason he was trusted by the authorities and by the people as well. Assisted by our own engineers he digested a plan of permanent fortifications. He demonstrated that though it would cost many millions, yet it was cheaper than a campaign of six months employing militia. This demonstration was a happy inspiration. The people could understand, and recent experience taught them to appreciate its pertinency and force. For years it was used as the determining argument in all discussions on this subject in Congress.

It is true that, during the period from 1816 when the system was inaugurated, until 1861, when the Rebellion broke out, the House of Representatives, acting under the influence of members from the interior, refused for two or three years to appropriate any money for sea-coast forts; but these ill-judged acts were but temporary in their effects, and, by the reaction resulting, caused greater appropriations to be granted than ever before. It is stated in the American Encyclopædia that Jefferson Davis inaugurated this revival of interest in our fortifications. This is not strictly correct. An unusually large appropriation was made the session which terminated just as he was installed in the office of Secretary of War, and when he was a private citizen of Mississippi; he had this appropriation at hand to start with, but it truly can be said that he did not allow interest in the subject to flag while he was Secretary of War. As a result of all this effort from President Monroe to Secretary of War Davis, and including them, there had been established a system of coast defensive works, at a total expenditure not far from $40,000,000 perhaps, that, for the day, very well served its purposes. You

are all familiar with the changes in the system that modern ordnance have rendered necessary. We are slowly moving to accommodate ourselves to the new condition of things.

But it was early recognized that fortifications without means of defending them, so far from being an element of strength constituted a weakness. That defense required guns, their appliances including carriages and ammunition, and also gunners to use all these. Herein the Ordnance Department found their principal reason for existence, and by 1861, their guns, for that period, were as good as the forts they garnished; while, as to gunners, the necessity for more of them as sea-coast defenders was the great argument by which the artillery increase of 1838 and 1847 was secured. Thus the building up the sea-coast system of fortifications has helped along not only the engineers, but the ordnance and artillery. The same argument, the necessity of gunners to defend our forts, saved the artillery in good degree in the reduction of 1821.

Hitherto we have confined our remarks to sea-coast artillery. Turning now to the field and siege armaments, we find striking if not so great advancement from former times—during and subsequent to the War of the Rebellion. We have illustrations of the artillery used during that war at this post (at Francis Barracks, Fla.), in the 12-pdr. Napoleon and 3-in. rifle. In so far as mobility is concerned, it is doubtful if our present field artillery has any advantage over that just mentioned. It undoubtedly were advantageous to have it more mobile, but the nature of the field armament places a limit on mobility. What truthfully can be claimed is great increase in man and obstacle-destroying power for the new guns. The weights that, from necessity, must be carried and manœuvred, in the shape of guns and carriages, are much more effectively adjusted than heretofore. The accuracy and power of the new armament are incomparably greater than those of former days. And as to these prime considerations, our guns and mortars of all natures, compare favorably with those of what are known as the first military nations.

It will be noticed that in the above table of U. S. Artillery no machine-gun appears, meaning by machine-gun one operated by means of a crank, as the Hotchkiss revolving cannon and Gatling gun. Some of my readers who have studied Kriegsspiel, will recall the destructive effect of the revolving cannon, and may wonder why, if the Kriegsspiel tables and allowances for

these guns were correct, they have been excluded from not only our own but every other civilized armament. That this is so I have the assurance of Mr. Very, one of the Hotchkiss' principal men. The reason seems to be that its utility is not general enough. No one denies that in particular positions the revolving cannon and other machine guns are very formidable. But, in conducting warfare against civilized armies, it becomes necessary to keep our artillery impedimenta down to the lowest limit consistent with efficient service on the battle-field. Hence, while acknowledging the advantage of special kinds of weapons, as machine-guns, for particular services, it becomes absolutely necessary to select for transportation with the army those guns that will be most generally useful in all the varying incidents of the campaign. Against a savage foe, like the British encountered in upper Egypt, or the Chinese in their present method of fighting, or rather not fighting, the machine-gun will be very formidable, as it will be sometimes in defensive positions and in flanking temporary field-works; while the field-mortar can be utilized to great advantage in driving the enemy out of the latter; but, when I speak of general-utility field-artillery, I refer to that which should accompany a well-equipped civilized army, and which, looking to all the eventualities of the campaign, would be found of greatest use in contributing to victory on the field of battle.

In terminating this paper I will read the following extract from the just-rendered report of the "Ordnance and Fortification Board," an institution which, by giving the artillery personnel a voice in determining important questions of fortifications and their proper armament and management, has added greatly to the consideration of the artillery arm in this country.

"The year has been one of positive and satisfactory advance. The want of suitable disappearing carriages for 8-in. and 10-in. high-power guns, which has so long retarded the completion of emplacements, is believed to be obviated, and that we now have such carriages of American invention, unequalled for rapidity of action by anything heretofore invented. Nothing now stands in the way of immediate completion of the contemplated mortar-batteries, which form so important a factor in the defense of our seaports, but the want of appropriations. Every element pertaining to the mortars, the carriages, the platforms and the batteries has been successfully worked out. * * * The supply of sea-coast guns

is constantly increasing, and the mounts are fully developed for each of the calibres. * * * The development and test of auxiliary defenses, such as submarine mines, movable torpedoes, rapid-fire and quick-fire guns and range and position finders, have reached a stage where we have only to make choice of the best."

It is noted with pleasure that this important report, received through an army paper after this article was written, confirms its statements and conclusions.

"THE MAN BEHIND THE GUN."

By Captain G. B. WALKER, 6th U. S. Infantry.

VARIOUS expressions, more or less honorable, have been used to designate the soldier who does not hold a commission signed by the President of the United States. He has been called "the enlisted man," "the enlisted soldier," "the private soldier," or "a member of the rank and file," but I desire to give him a still more honorable title and to call him "the man behind the gun." But in time of peace he can be regarded as holding this title by brevet only, as it were; for we never hear him called by that honorable name except by war historians and pamphleteers. He must in peace time be regarded as merely in a chrysalis state, and even when straining every nerve on the hot and dusty target range he at last wins the meritorious sharpshooter's cross, he is only then partly extricated from the cocoon by which he is surrounded in peace time. But on the battlefield, on the march and in the bivouac as he makes his coffee in his own tin cup and fries his bacon on a stick, we find the man behind the gun, the enlisted soldier in active service against the public enemy, the man who saves his country in her hour of peril.

We have heard much of late of our new rifles and smokeless powders, and while every one must be sincerely thankful that we are keeping pace with other nations in this respect, a doubt arises as to whether our methods of preparing the soldier himself for war have kept pace with the modern improvements in the rifle. For millions of the finest guns would never save a country, if the men of that country were cowardly, unpatriotic and effeminate.

Next to Lincoln's Gettysburg speech it seems to me there is no more pathetic or more beautiful appeal than that of General Sherman which is quoted on the first page of every number of the JOURNAL OF THE MILITARY SERVICE INSTITUTION. "I cannot help plead to my countrymen at every opportunity, to cherish all that is manly and noble in the military profession, because peace is enervating and no man is wise enough to foretell when soldiers may be in demand again." These words ought always to impress an officer with the seriousness of the work in which he is engaged. In the weary routine of drill, or the tedium of garrison life, or when in the centres of population we are surrounded by men who are winning wealth or distinction in the various professions while we can only do our duty and bide our time, we should remember with pride that even in peace time we have the honor to mould the material which when finished in the furnace heat of war will produce the man behind the gun, a man who in his perfect state of development is the peer of any potentate on earth.

A short discussion of the means by which the soldier may be prepared and made fit for war or campaign is the object of this article, and it is desired to emphasize that, in the training and treatment of the soldier in peace time his future efficiency in war is paramount and all other things are entirely secondary.

First and foremost of these means is discipline, and although it has been much written about, its administration varies to a considerable extent with different commanders, and ideas are therefore submitted with some diffidence but with sincere conviction.

Discipline is defined as "subjection to rule," therefore the perfectly disciplined soldier has the *habit* of obedience. He does not, generally speaking, obey because it is right, or from fear of punishment, nor yet from affection for or confidence in his commander. Although all these sentiments should form a part of his character, especially the last, yet the perfectly disciplined man obeys simply because it does not occur to him that it is possible to do otherwise.

To cultivate this habit of obedience is especially the province of drill. It will probably be admitted that fully nine-tenths of that half of the drill book devoted to the close order would not necessarily be practiced from the time of leaving the base of operation up to the actual deployment on the battle-field. The

bulk of this drill must therefore be intended as a means of discipline. It should therefore, in one sense, be severe. How little one sees now-a-days of the old-time drill sergeant. The setting up exercises have been much extended in their scope in our present drill book and are excellent as a calisthenic exercise, and when executed with quickness and life (with the special exceptions laid down) are far more conducive to prompt obedience than when lacking in vim and quickness. And the same holds true with the entire close order drill. The least habit of carelessness in obeying the words of command at drill begets carelessness in obeying orders at other times. A sharp rebuke to the careless soldier on the drill ground may be made forcible without show of temper and cannot fail to do him good if there is any good in him, and if he is kindly treated by his officer in essentials he will respect him the more and also the authority he represents. The soldier is easily satisfied, and if he is well fed and has reasonable freedom off duty he will not mind the severities of drill. Close order drills may be frequent or not, according to circumstances, but they should now more than ever, it is believed be severe, in the sense that instant and careful obedience to the word of command should be insisted on.

Much has been well written of late regarding the individuality of the soldier, and therein as a nation we have reason to congratulate ourselves above all others in our "man behind the gun," but there is probably no case on record where the intellect or judgment has been dwarfed by a perfect manual of arms or a good "march past."

In every command there is still quite a number of enlisted men left who have the proud distinction of having served the country in time of war. These men are apt (perhaps naturally so) to look with some little contempt on an exact drill while remembering the stirring scenes of conflict. Such men should be reminded by their officers of the increased responsibility resting upon them as examples to the younger men. If after this they continue careless, not making effort to amend, no further consideration should be shown them in this respect, as they are more culpable than the young soldier who has not yet had time to acquire discipline. It is not always pleasant to teach discipline. Unfortunately we are all born with a repugnance to it. In infancy we appropriate all things to ourselves without regard to the laws of *meum* and *tuum*, and in manhood we are naturally

averse to yielding our will to that of another; and this leads us to another means of discipline, which is punishment.

Punishment is an established means of discipline, and therefore holds an important place in the scheme of preparing a soldier for war service—but more, if administered with judgment it will teach a naturally good man who errs, as all may, at some time, that his conduct is a discredit to his uniform and inconsistent with his own self-respect, or the respect of his officers and his comrades. And herein lies a field for much good work by the Summary Court and for company commanders. Next to perfect discipline what can be more important than the manly self-respect of the soldier. Such a man will hold his ground under a heavy fire through his pride; for the bravest and the coolest in action from the general down, have frequently told us that it is pride and self-respect alone in almost all cases which produce what we call bravery. Therefore as General Sherman says let us "cherish all that is manly and noble in the military profession." How easily can a company commander teach his men that it is unmanly to do a mean thing, for soldiers are quick to observe and to take their cue from their chief. A few words of admonishment here and there, which by the way will be freely discussed in the company, a painstaking and discriminating care in preferring charges; how much effect these things may have in cultivating manly self-respect in the men, I think we do not always fully appreciate. It might seem a very little thing for instance, for an officer to privately caution one of his men that being in citizen's clothing he should always wear a cravat with a white collar; but the man will instantly recognize what he had not thought of before, that the cravat makes him look more like a gentleman and he will respect himself more also because his officer takes an interest in him. Many young soldiers like to appear a little "tough" when they are in reality not so and have very good qualities. A word to such should be sufficient. Again how quickly will men take their cue on the target range when cautioned that the taking of petty advantage is unmanly. It will have more beneficial effect in the end than the watching of the skirmish line. And in preferring charges how easily can the officer impress his own individuality on his men by pressing home the punishment for mean or unmanly conduct and virtually condemning some slight derelictions which have little bearing on his efficiency behind the gun. And the Summary Court being the custodian of by far

the greatest number of these cases by uniting judicious punishment with words of caution and advice can probably do more than any other one officer whatever to elevate the manly self-respect of the whole command.

Now to come to the practical preparations of the man behind the gun for war time, it is naturally to make him thoroughly acquainted with his gun, for a million of men would be far worse than useless without arms or totally unacquainted with their use. The special means of fostering this acquaintanceship are extended order drills and target practice. Probably all will allow that the bulk of the last half of the drill book is excellent and yet how much are we hampered in our drills by our small companies! If army officers could be transferred for one season from the executive to the legislative branch of the Government, in other words if we could serve one season as Senators and Representatives in Congress, there is no doubt we would promptly have companies of 100 men, and this too without unreasonable increase of the commissioned roster. But we cannot help our small companies though with one set of fours for a section at drill it seems almost a case of *reductio ad absurdum*. Drills in extended order should be frequent, and in the long seasons we have they can easily be so, beside having plenty of time for working up an excellent drill in close order. A consolidation of two companies into one during part of the season might be advantageous, being in fact almost a necessity with such small companies, to practice the attack formations. As to fighting in extended order, which the improvement in fire-arms has rendered necessary, we have reason to congratulate ourselves not only on having been the real discoverers of that system, but also because the intelligence of our masses and their strong individuality make us peculiarly adapted to that kind of tactics. The individuality of the soldier should therefore be fostered by every means consistent with true discipline.

As to target practice there can be no doubt it is an important means of preparing the soldier for war. While it was a saying of our last war that it took a ton of lead to kill a man, and there must be in every engagement a large amount of wild shooting, still with the increased precision and range of present fire-arms good marksmanship in the mass must count for a great deal, and the thousands of good shots now scattered throughout our land who have had their instruction in the regular army, would be a tower of strength for us in the event of war. We are all looking forward

with increased interest to what modifications may be necessary in our present firing regulations. The excellence of that book speaks for itself, for how else can we explain the untiring interest which target practice with its excessive labor has maintained for so many years. It seems probable that except some slight modifications on account of longer range and flatter trajectory the book will need but little change, though it would appear that a large portion of the theoretical part of the text might be omitted, and the number of competitions might be materially reduced both on the ground of expense and the loss of the services of the competitors while absent from their proper commands.

To make a fighting force effective it should also have a system of cooking its food on campaign which will minimize those enormous casualties resulting from sickness in camps which probably exceed in war the number of killed and died of wounds combined. The company is the unit, and under the company mess system, which generally prevails in our service, the men are taught to cook in a practical way and they meet at the mess table in a spirit of comradeship which is good for the general morale. And, as before remarked, good *esprit* should be cultivated in every way for it produces on the battle-field deeds of daring and noble self-sacrifice.

Finally practice marches are very necessary and proper means for war preparation, though we are unfortunately much hampered by municipal regulations and testy property owners. By practice march is not meant such marching as will toughen the men to tread off their 20 miles a day; for where is the use? After a couple of months of garrison life (or even less) their feet and muscles would be as tender as before. It is the camp at the end of each day's march that counts, and for this purpose 5 miles will do as well as 20. The men should be instructed in pitching, draining and policing camps, in cooking with camp kettle and dutch oven; in doing camp guard and outpost duty; in short with such means as we have we should simulate the campaign and bivouac.

Other things might be mentioned at some length bearing on the preparation of the soldier for active service, for after all everything in the line of instruction ought to aim at this end. When in time of long continued peace we are apt sometimes to lose sight of the importance and the honor of training "the man behind the gun," let us remember the words of the martyr Pres-

ident: "It is rather for us to be here dedicated to the great task remaining before us; that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion."

THE CAPABILITIES AND LIMITATIONS OF THE BICYCLE AS A MILITARY MACHINE.

By First Lieut. R. G. HILL, 20th U. S. Infantry.

THE year just passed has seen the greatest impetus given to bicycling, especially in the United States, England and France. All classes are taking it up, and those who do not ride the wheel lose a fine sensation of power and freedom. It has become an essential feature of modern life, and it is estimated that last year over a quarter of a million machines were sold in the United States and that there are in this country over a million riders of the wheel. However, I have not space to discuss the bicycle generally. All are more or less familiar from the daily papers with the big records made by experts on good and indifferent roads. It is to its capabilities and limitations as a military machine that I wish to invite your attention; and I will discuss the subject. 1. As to its employment by individual wheelmen or small bodies, such as couriers or messengers, patrolling or reconnoitring parties and its use for topographical purposes. 2. For the movement of bodies of infantry from point to point, including its use in and about our large cities in times of riot.

Most of the European armies have adopted the bicycle to some extent, the most general practice being to attach two, or a small number, to each battalion.

It has found its principal use thus far in messenger service. The cyclist can move more noiselessly and secretly than the horseman, and on good roads usually at higher speed. He can travel at good speed on very indifferent roads, across some meadow and prairie lands, through sparse woods with little underbrush, between the rails of a railway track, even if the ties are not entirely covered with dirt; but on roads heavy with sand or mud, across plowed or cultivated fields, and in woods generally he would be better off on foot. When it is necessary to send a message on the field, there should be no doubt as to its rapid transmission—

the speed of the messenger must always be available. The cyclist cannot in this capacity replace the horseman; he would be unreliable. A cyclist courier line on good roads between certain points would do fine service, but if the roads are covered with troops or trains the horse would be better.

For patrolling the cycle would have many and great advantages over the horse. It would be practically noiseless, raise little dust, be less conspicuous to the eye, there would be no neighing, the machines could be secreted and left without a guard, or be lifted over a fence or carried for a considerable distance. It is not possible to tell from the track in which direction the wheel is travelling. If escaping, the wheel is a smaller target although the rider himself, if struck, would have fewer chances of escape. If suddenly attacked the horse could be more readily turned about on a narrow road, and the wheel would be under greater disadvantage with a hill behind. The horseman could see more on account of his height and broader field of vision, especially on a road lined with hedges, and the wheel has to be more or less watched by its rider, while the horse looks out for its own steps. The roads might be too bad to use the wheel, but as it should be used only by infantry patrols and not to replace the cavalry, the infantry would simply do what they always have done—walk.

For topographical purposes the bicycle is of great value. With a cyclometer attachment, which can be read instantly, unlike the old adometer or the calculation from the time and pace of an animal, one can do more rapid and accurate work than with a horse, especially if without some one to hold the animal. A board like the cavalry sketching board, but larger and without the compass, attached to the steering pillar, could be used roughly as a plane table by having a swinging prop for the wheel, or compass-bearings could be plotted on it more rapidly than in a note-book or on the cavalry sketching-board, as it would really furnish a convenient table set up for use the moment one halted. A wheelman could not overlook so much ground between stations, and this is no mean disadvantage, as every one familiar with taking rapid topography knows how much is seen and taken from the increased height of a horse while riding between stations. Again comes in the question of roads and places not fitted to the movement of the wheel, but the topographer usually has more latitude than the patrol and the patrol more

than the messenger. Here as in other instances the cycle cannot entirely replace the horse. We must in military operations have officers on horseback who can make rapid sketches independently of the state of the roads or nature of the country. The bicycle is essentially an infantry machine and if carried in some numbers with each battalion must be of the greatest value in advance guard and outpost duties, for patrols and to enable infantry officers or others to make quick observations. Their presence will frequently admit of fewer horsemen being attached to a command, and thus the cavalry will not be so broken up into small detachments.

As to the cyclist supplanting light cavalry in its duties of security and information, or covering an army with a cyclist instead of a cavalry screen, it is, I imagine, not to be thought of. We need cavalry then—a force which can go anywhere, on all sorts of roads. How bodies of cyclists can increase and accentuate the powers of the cavalry appears further on.

It is in rapidly moving considerable bodies of infantry that the wheel must become of the highest importance in time of war. While in this case the question of good and bad roads is a most vital one, it does not enter in the same way as in those previously discussed. Here, there is no question between the wheel and something better, but solely between it and the legs of the infantryman; we are using the wheel on duties where in the past the horse has been generally employed and find that although a valuable adjunct to the foot soldier it cannot replace the horse—that the latter is more reliable. Supposing the cycle cannot be used on account of temporary bad roads. What of it? Are you worse off than before? The infantryman still has his legs. The idle machine eats nothing and can be left behind with little trouble and brought up later on, if necessary and practicable, by the quartermaster's department. They are light (about thirty pounds each) and the question of transportation by rail or wagon should not be a difficult one. We know that during the past three months of fall and winter there have been but few days when we could not have ridden with comfort and pleasure on the country roads about Fort Leavenworth, and they are not very good roads either. Can it be asserted with any degree of reasonableness that, if there had been military operations in this vicinity during these months, the few days of bad roads should condemn the wheel? While it would be

more serviceable on such roads as exist in Europe and some portions of the United States, even on such indifferent ones as are generally found in this country a column of twos could march a large portion of the year and the bicycle could do highly effective service. We know that those not especially expert can move at a speed of ten miles an hour without great fatigue and keep it for some hours if in good condition and hardened to the road. Think of a force of infantry going in almost any direction without the assistance of rail or boat, forty or fifty miles in one morning and appearing on a field not leg weary and exhausted as from two days' hard march, but comparatively fresh and ready to fight all the afternoon! and this seems among the certain probabilities of the future. But to approach this subject logically and fairly it is best to consider the march of a column of cyclists. As the object of cycle drill should be to move bodies of troops on roads, I start with a column moving on a road,—a regiment of 1200 men in column of fours. Assuming for the present some arbitrary figures, each four is given a depth of twelve feet, six for length of wheel and six feet distance. For present convenience of discussion there is no interval between companies. The average speed is eight miles an hour, less on ascending and more on descending slopes.

Suppose that the head of column arrives at the foot of a slope steep enough to make it desirable to dismount. If the distance of six feet is to be preserved throughout, the entire column must take up the speed of the head, and the speed of the rear is sacrificed. The head of column arrives at the top and has a level stretch ahead, but the rear must walk to the top of the hill, and, if distances are to be preserved, the speed of the head will be sacrificed. The entire column has walked from the time the head arrives at the hill until the rear leaves it. But the column can in walking up hill be closed to a distance of one foot. This done the rear will be able to keep up its speed a portion of the distance.

Suppose that as each four attains the top, it takes up the speed of eight miles an hour. The column closed to one foot has a depth of 700 yards. From the time the first four arrives at the top and takes the wheel until the rear does the same would occupy about seven and a half minutes, or the column would be strung out over a mile of road. If distances are not closed after this, and another hill is encountered, each four closing up to one

foot before dismounting, the head of column would have walked seven hundred yards at the moment the rear four arrives at the bottom at the speed of eight miles an hour, and the entire column would have a distance of one foot between fours. The operations can be reversed, and neither the head or rear of column lose speed. The hill need not be seven hundred yards long for the application of this demonstration, as it applies in the same way to a long or short hill. I will say that seven and a half minutes is rather good speed for one to push a wheel seven hundred yards, but it could be done on short slopes. If at a slope the speed is only reduced, the same reasoning would apply, and it need not be the subject of formula; each four could retain its speed to the foot, and ascending it the fours would be closed up to a distance proportional to the reduction of speed, and opening out would occur the moment a level is struck. Descending, a still greater opening out would occur, but each four would close up at the foot.

Twelve hundred wheels in column of four, or better, three hundred fours or twos, is, in ordinary country the greatest number that can march at eight miles an hour on a mile of road. This would give ten feet between fours or twos and thirty-four between companies. Ten feet between fours would allow an obstacle to be passed, each four forming twos as it approached it. If files have to be formed the column would have to halt. A long column on a road with numerous ascents and descents would in the different portions have all sorts of distances, although the average number on each mile would be the same. This will doubtless be offensive to the military eye, or to some military eyes, but it is the only way to obtain speed from a bicycle column. The greater the speed the greater the lengthening out. In case a column of cyclists is marching with infantry it could be closed up to three feet distance. In theory it could close up more, but even this distance would be trying to the wheelmen. As at this speed the effort of pedalling would be little they could be subjected to the extra trouble, as room in the column would be valuable. There would be no difficulty in passing obstacles, as each file or two could, immediately after passing, mount and close up. However, such narrow obstacles do not occur.

Cycles can be conveniently and compactly stacked by closing up in column to one foot, each number one and two resting their wheels against those of three and four. A barricade against cav-

alry could be made, by forming two companies into line at a foot distance, the rear company facing about; each rank could then swing their wheels parallel to the front, and lean the two lines of wheels the one against the other. The above principles are about enough on which to form effective cycle drill regulations.

The only regulations* I have seen are those by Gen. Albert Ordway of Washington. They are based on a line formation, with an interval of six feet between cycles. When wheeled into column of fours the resulting distance is eighteen feet and into column of twos six feet. Cycles are stacked in line, each odd and even number leaning their wheels the one against the other. This does not give a compact stack and leaves the men too much scattered when it is desired to form up as infantry, besides taking up too much room by the side of a road. The line formation for the cycle is a wholly unimportant one, and should result from that which is best for the column. We have seen that ten feet distance is the least for high speed, or sixteen feet for each column of fours. This would give four feet for each wheel in line. As the line formation should be used only for ceremonies the space in line might be reduced to three feet, giving six feet distance. As the cyclist should be drilled in infantry also, and as the object of the cycle is only to cover distance in column, the drill should aim primarily at getting a column on the road, marching it there at different rates of speed, halting and stacking and forming up as infantry, passing obstacles, ascending hills and getting under way without undue stringing out, the rapid transmission of signals for halting, marching and increasing and diminishing gait.

Now for a few comparisons between depth of column, rapidity of arrival, etc.: Twelve hundred infantrymen occupy less than one-third of a mile of road, and marching at eighty-eight yards a minute would pass a given point in a little less than six minutes. Twelve hundred wheelmen at eight miles an hour would require seven and a half minutes to pass a point. Therefore, after the head of a column arrives it would take the cyclists somewhat longer to form front into line, even though the entire movement could be performed on the wheel. Six thousand cyclists could form up into column as infantry in about half an hour. Unless

* Published by the Pope Manufacturing Company. This company takes great interest in military bicycling, and manufactures attachments for carrying the rifle and other portions of the equipment.

the distance marched bears to the length of column a proportion at least as great as seven and a half to six there is no time gained in using the cycle, except that the men would be fresher, and it might be necessary to throw in each regiment upon its arrival. However, the rule is a good one to remember. It is apparent that in forming front into line, unless the entire movement could be executed on the wheel, it would be best for many battalions to stack at the side of the same piece of road. How to form to or on the right or left into line, and get the troops into action in a minimum time is discussed further on.

The foregoing has reference to the wheel with a single rider. A tandem would increase the length of column but little for the same number of wheels, and the force would, of course, be doubled. The writer knows little about the multicycle. As between tandems and the single wheel, the latter is less cumbersome, there would be less confusion and time consumed in mounting and it can go over worse ground, but the tandem has three supreme advantages—cheapness, lightness and economy in depth of column for the same number of men, who would get on the road and arrive faster. If six thousand men were to be moved six miles on the single wheel the rear would be delayed 37½ minutes in taking the road. With tandems the delay would be but 18 minutes, and this is considerable when one considers that the head would arrive in 45 minutes. If compelled to push their wheels the burden would be lighter, and in case men are killed or wounded and left behind, there might be more machines saved, as one man can propel a tandem on fair roads a considerable distance without great fatigue. Without doubt there should be provision made for carrying the wheels on wagons. Low, light wagons of special construction, drawn by two horses, could carry fifty tandems. It would not seem necessary to have the full quota of wagons, perhaps not more than half. Being empty, they could keep not far behind a force. In the course of an engagement many of the cyclist bodies, perhaps all of them, would be moved away from their stacks, and it might be wholly undesirable for them to be compelled to march back. This fact I hear urged as an objection to the wheel, but as such it has more apparent than real force. In an engagement the cyclists would usually be in the van, and fresh troops from the reserve would or should be used to pursue. The former could return a considerable distance for their machines, and then close up on the infantry

in a short time and soon be again in the van. They could be used on foot for immediate pursuit, if necessary, and leave their wheels behind, but it would of course be unwise to send them away immediately if foot troops are available.

As to the service of security and information for a body of cyclists on the march, it is evident that, moving at the rate of eight miles an hour, or even somewhat less, flankers could not be thought of. This places limitations on their use at high speed. In other words a reasonable immunity from attack must be presumed. If the speed is reduced the flankers should be horsemen, and the column could take the speed of a cavalry column. Distances would be reduced and the column be more easily protected. Cyclists can furnish all their own advance and rear guard excepting flankers, and mixed cycle and cavalry patrols could be used on the flanks on parallel roads. A platoon of cavalry attached to a cyclist brigade would probably be sufficient.

Having attempted to outline the general principles of marching and drilling cyclists, I venture to suggest some cases in which they could be employed to advantage:

1. Where several columns are marching in a general parallel direction, covering a considerable front and on the lookout for the enemy. The cavalry screen could be immediately backed up by bodies of cyclists on all the roads. By this method their action might be dissipated at several points. Unless roads near and parallel to the front exist it would be difficult to throw them rapidly to the important point without interfering with the march of foot soldiers behind. They would not be so well in hand for decisive action as if held with the main body in rear. Where is it best to march them if so held? If at the head of the infantry, they would delay its taking the road. If at the rear, they might interfere with the trains. If distributed through the column at the rate of 1200 wheels to the mile, at three feet distance they would take up over half of the mile, leaving room for nearly 2000 infantry. If then they are distributed at the rate of one regiment of single wheels or two of tandems, to two of infantry, they would constantly have about the right amount of road for high speed, and could get off with little delay. If massed at the head or rear, at three feet distance it would take a good while to get the distance of ten feet. However, too long a column of cyclists would be difficult to keep closed up, and if a battalion is sandwiched between two of infantry they would

tend to keep it closed. When ordered to the front 6000 cyclists would clear the column in about half an hour. As the rear of the column would be the first cleared, it could, if the front is halted until the cyclists pass, close up about two-thirds of the two miles of gap left. If the Germans had had bodies of cyclists with each corps of the second army on the morning of August 16, 1870, the third corps would not have been compelled to fight single-handed from nine in the morning until three in the afternoon at Vionville in its efforts to hold the right wing of Bazaine's army. They were reduced to terrible straits in their efforts to hold Vionville, necessitating the charge of Von Bredow's eight hundred cavalrymen. This charge would have been lost to history, to be sure, because reinforcements would have arrived long before it became necessary. An examination of the map and some knowledge of the excellent roads south and west of Metz should convince one how efficacious cyclist bodies would have been on this theatre.

2. To execute behind the cavalry screen a turning movement and come in by a considerable detour, if necessary, on the enemy's flank. The cyclists with each column could be directed towards the designated flank by roads far enough in rear not to interfere with the march of the infantry columns. Supposing the leading regiment of a brigade has arrived on a stretch of road a mile in length opposite its point of attack. Time may be a most important element. It halts without closing up, excepting by companies to stack cycles. If deployed as skirmishers a firing line would result with a man to each yard and a half of front. It advances as skirmishers, and the next regiment pedals up, stacks on the same ground without closing except as before, and advances as supports. The third follows suit and follows as reserves. While the mixture of organizations that would result is bad, the saving of time, about fifteen minutes, might compensate and in many cases surely would do so. Or this movement could be executed on right or left into line.

3. To be used as reserves to support threatened or weak portions of the line either in the attack or defense.

4. Where an army is holding or observing a defensive line such as a river, with detachments at the main points, the cyclist corps held with the main body in rear could be thrown to a point where the enemy is concentrating for crossing, and reinforce it until the main body arrives, or if the movement proves to be a

feint, the cyclists can be withdrawn and appear at the serious point. On the other hand the corps could be used for making a feint; then be withdrawn and appear at the real point of attack.

5. In pursuing a retreating army, bodies of cyclists could follow on the heels of the cavalry to harass the enemy's flanks and perhaps make him turn at bay and compel him to fight the whole army in a disadvantageous position. In retreat, especially if precipitous, disorganized bodies of cyclists would be a nuisance, but if there is time to get their wheels they can get out of the way faster, and by the time they are organized and halted they would be ready for the regiments on foot to fall back on. One can picture a company of devoted cyclists holding a ridge, and when the enemy begins to get up in numbers, rushing for their wheels and go coasting down hill at the rate of five hundred yards a minute.

In fact there will be a thousand chances open to the enterprise and skill of the commander who understands the capabilities and limitations of the bicycle, who is blind neither to its merits nor to its faults, and who does not try to use cyclists as cavalry, but as infantry under changed conditions.

There seems to be no reason why the cavalry should be reduced or lose any of its importance by the mounting of a portion of the infantry on the cycle. In fact it would often be needed for the immediate service of security and information of cyclists, when the foot soldier could look out for himself. The cavalry screen should be all the more effective to admit of the rapid march of the cyclists without flanking protection. It could act more boldly and find an additional stimulus for enterprise and courage and tenacity in seizing and holding positions in the feeling that its action would be more quickly supported and brought to more immediate results.

I again ask those who are afraid of occasional mud. What of it? You still have the legs of the infantryman and you had no more before. Cases can be cited where the bicycle would have been available where neither man nor beast could move without difficulty—roads and fields covered with ice, as during the period before the battle of Nashville, when the armies were ice-bound for a week, the country being like a field of glass. Bicycles, especially for the service of security and information, would have been singularly effective.

To us the problem of the use of the bicycle for troops sta-

tioned near our large cities is the most immediately important one, and the conditions are entirely simple and the results would be less uncertain. The question of bad roads does not enter, and the conditions of marching, time, formations, etc., would be known in advance. For marching from point to point within a city a few cavalry should be attached to each cycle command to clear the streets. In case the railroads are stopped as they were last summer, commands might, if roads admit, be moved several hundred miles to necessary points, not only Regulars but the National Guard as well. Numerous cycle clubs already exist, and the common possession of the wheel forms a bond of union which should be taken advantage of by the general government and states. In time of war we would have at hand to draw upon, large numbers of our best and most vigorous young men for cycle organizations. There should be a really effective system of cycle drill regulations adopted, so that the widely dispersed knowledge of the wheel could be made effective as soon as possible, and this system should aim not at fancy evolutions, but at the serious problem of marching on roads without undue stringing out.

The bicycle is to-day a permanent feature in the world's economy, and it is to be hoped that neither cold military conservatism, which judges too frequently almost with ferocity and without investigation, nor the blind enthusiasm which grasps at everything new with an equal lack of investigation, will exclude the wheel from its greatest function, viz.: to enable the infantry to have at hand, without expense and care for grooming, feeding and watering, a cheap, convenient and swift means of transportation from point to point.

MARTIAL LAW IN CEYLON.

By First Lieut. H. C. CARBAUGH, 5th U. S. Artillery.

LETTERS patent appointing Viscount Torrington to be Governor and Commander-in-chief over the island of Ceylon, were issued March 27, 1847, by Queen Victoria. At this time the British government was, by treaty, guardian or sponsor, for the Buddhist religion,—the religion of the natives of Ceylon. Lord Torrington carried with him official instructions to withdraw the British name and power from the active support of pagan worship. Accordingly on October 2, 1847, the governor proceeded from Colombo to Kandy and delivered over to two chief priests and the principal chief the "Delado-tooth," which was a relic said to be Buddha's tooth and in regard to which the natives had the superstition that in whatsoever hands the relic should remain, there would always be the sovereignty of the island. Up to this time the relic had been, jointly, in the hands of the priests and of the government agent of the central provinces.

The native king of Kandy resided in the palace of Kandy—in the temple of which the Delado tooth was kept—there, also the government agent resided. He had charge of the keys, and mounted a guard of honor over the temple, the tooth being locked up in a small apartment thereof and deposited upon a shrine in a casing covered with precious stones. This abandonment of the guardianship of the relic by the British government led to discontent in the priests, who joined with the headmen—native chiefs of the island who were also dissatisfied on account of lack of control over the natives due to the cultivation of coffee plantations—and together they stirred up the natives to insurrection.

Colonel Drought, the commanding officer of the British garrison, 600 strong at Kandy, received information that 60,000 insurgents with 24,500 fire-arms were approaching Kandy burning property, that at Matelle and Kurnegalle the records were destroyed, the gaols forced open and the prisoners released. At two o'clock on the morning of July 29, 1848, he sent out a detachment of 100 men, the advance guard was fired upon by the insur-

gents at dawn, this was followed by an action in which there was considerable loss to the insurgents.

The indications being that of a general uprising, Lord Torrington on July 31st, issued a proclamation that in the disturbed district martial law should be in force until further orders, and calling upon all loyal subjects to aid and assist the armed forces of Her Majesty in suppressing the rebellion. A second proclamation was issued extending the territory over which martial law was in force. Martial law remained in force until October 10th, of the same year, a period of about ten weeks. A select committee of the House of Commons was appointed in 1849 to enquire into the grievances complained of. Among those examined were Sir T. Herbert Maddock, and Sir David Dundas. From the report of the select committee of the House of Commons appointed in 1849 to investigate the matter their testimony is as follows:

Sir T. Herbert Maddock.—I have risen to the rank of a member of the council, and held the office of president of the council and deputy governor of Bengal for nearly three years. During the whole of my career I was only for a very short time subordinate to any authority except that of the governor general in council. Six years ago I was elected a member of the Council of India. During the period that I have been in India there have been several insurrections in different parts of the country, and some of them have been in character not altogether unlike the late insurrection in the central province of Ceylon; that it to say, they have been among hill tribes, and semi-barbarous tribes. In the mode of dealing with insurrections in India I think that the government have resorted to almost the same means of suppressing them that was adopted on the late occasion in Ceylon, although in India there is no necessity for the proclamation of martial law, as the governor-general in council possesses full and ample authority to confer upon any officer or upon any commissioners, either civil or military officers, plenary powers, and that has been the case on several occasions. I have obtained a memorandum from a distinguished officer who retired from India some years ago, who has been concerned in the suppression of insurrections in the district which is called the district of the southwest frontier of Bengal. There was an insurrection there, in the neighborhood of Palamow in 1832. On that occasion extraordinary powers were bestowed by the government upon the magistrate appointed specially for the purpose of bringing to trial and

punishing any insurgents who might be apprehended. It appears that in consequence of the military operations there having succeeded in a very short time in restoring tranquillity, there was not found any necessity for the exercise of those extraordinary powers. The extraordinary power was not the power of martial law, but the power to bring to trial and sentence to death, submitting the cases for the sanction and approval of the governor general in council. The power so conferred was in substitution of the ordinary process under which the magistrates commit capital cases to be tried by a judge of session, who on conviction submits them for the confirmation of the Sudder Dewanny Adawlut before sentences of death are carried into execution. In the cases to which I allude, the government empowered the magistrate, deputed especially for the purpose, to try and sentence to death, and to refer for sanction, before carrying such sentence into execution, to the governor general, superseding the courts of law. The magistrate was not the magistrate of that part of the district; he was deputed especially for the purpose. The prosecutor, of course, would be some officer on the part of the government. The power was not exercised. In consequence of the insurrection being very shortly suppressed, this power was not exercised on that occasion. A similar course appears to have been pursued in certain estates in the district called the Jungle Mehals, in the year 1832–33. Trials did take place upon that occasion. Major Wilkinson in 1835 and 1836, under orders of the government, put down an insurrection in Kohan-Singoree, which is one of the districts comprised in what is called the southwestern frontier agency. Upon that occasion he himself tried, in his capacity of sessions judge, all the prisoners who had been apprehended by his assistants, and committed to him by them under their authority as magistrates; and he, on that occasion, referred all his proceedings for the confirmation of the Nizamut Adawlut. He was both prosecutor and judge, I fancy, but I know that in that part of the country there is a summary process, or used to be in those days, of criminal jurisdiction; there might be a person, called the vakeel, prosecuting on the part of the government. He is a servant of the government; the advocate of the government; a native advocate. Major Wilkinson himself was appointed a commissioner, and the proceedings were referred to the Sudder Nizamut Adawlut, which is the principal civil and criminal court of appeal for all Bengal. It is a

court independent of the Supreme Court, and has jurisdiction over all trials held everywhere out of the jurisdiction of the Supreme Court in Calcutta.

In the year 1835-36 a serious insurrection occurred in the Goomsur district, a district which is subject to the Presidency of Madras; on that occasion the government of Madras appointed a special commissioner to whom they delegated extraordinary powers; in fact, unlimited powers, I believe. Under his orders the rebels who were apprehended, were tried summarily by a court composed of military officers with the army then acting in the Goomsur district; if found guilty and sentenced to death, they were forthwith executed by order of the special commissioner. I have myself heard so from officers who were serving with the force upon that occasion; those trials were of the nature of a court-martial, for the court consisted of any number of officers who happened to be present with the regiment or detachment to which the prisoners were brought for trial. I believe the government of India have power to delegate any authority they think necessary in the event of any disturbances in any part of India, and which it possesses itself, therefore the proclamation of martial law there is unnecessary. I imagine martial law never has been proclaimed there, simply because those countries have been out of the jurisdiction of the Supreme Court, and martial law was not required; there no writ of habeas corpus could issue to interfere with the exercise of the authority of any commissioner who might be empowered, whether civil or military.

The governor in council had himself the power to direct proceedings and confer authority, which are, as regards the extent of the power, equivalent to the proclamation of martial law, where such a thing is necessary. The government of India have the power of life or death over their subjects, and they may delegate that power where they like. As an example of that I may be allowed to say, that nearly 30 years ago I was myself vested with the power of life and death in criminal trials, and unlimited power in civil cases; that is to say, limited only subject to an appeal to the King in Council, the same as the Supreme Court, and the courts of Sudder Dewanny Adawlut. Such is the power which the government of India can confer upon any ordinary occasion, as well as on any special emergency.

I arrived in Ceylon about the 23d of the month of July, 1848. I remained in Kandy nearly a month. It had been my intention

to have left Kandy, and to have proceeded in the neighborhood where the rebellion broke out, that is, the neighborhood of Matelle, where I possess a coffee estate. I was prevented from proceeding there in consequence of the information which reached the authorities at Kandy, of a king having been elected, and being on his march to Matelle, and having subsequently taken Matelle, and of the necessity of sending out troops to oppose him there. I was therefore prevented from making the excursion I intended.

With regard to the nature and extent of this insurrection, I certainly was then of opinion, and I now can have no doubt, that there was immense danger to be apprehended from this assemblage of people; and it appears to me inevitable that if there had been any hesitation or delay in proceeding to act against them, and to attack the first body that could be reached by the troops, which was about 12,000 men at Matelle, in the course of 24 hours, or at the utmost 36 hours, a large portion of those 60,000 men would have been assembled in force immediately round, and in the environs of the town of Kandy; and I can only imagine that in that case the small force which was at the disposal of the commanding officer must have been unable to have protected the town; the town must have been plundered and probably burnt; it must have been unable to protect the country in the neighborhood, and I should think most probably would have been so hemmed in that it must have been straitened for provisions, and in all probability would have been compelled to retreat.

Upon those events occurring the commanding officer was rather loath to believe that an insurrection of any importance was likely to break out, and he proposed that before anything was done, Mr. Buller should ride over there with one of the staff officers of the station, and see what were the circumstances, and when they came back and reported he would be prepared to act; and in the meantime he issued orders for a detachment to be in readiness. Captain Jolly, who was one of the station staff at Kandy, and Mr. Buller, immediately rode out on the road to Matelle. They proceeded about half way, when they were informed that the whole country was in arms; that there was a very large detachment of armed people immediately on one side of the road that they were going to advance along where there was a narrow pass down one of the mountains; and that Matelle had been taken and partly destroyed, or that all the public buildings had been destroyed. At the same time they met Mr. Waring himself has-

tening in from Matelle. On this they came back as quickly as possible, and the commanding officer, Colonel Drought, then doubled the strength of the detachment he had originally ordered, and they prepared to march to Matelle at once. When they arrived at a place called Wariapolle they met with a body of about 200 men, on one side of the road, who commenced a fire upon the advance guard of our troops; an attempt was made to parley with them, some of them were absolutely disarmed; the military did not proceed to attack them, and to fire upon them, till there had been an attempt made to subdue them and to disarm them without force. But while this was going on another party in a jungle, I believe, opened a fire upon some of our troops, and the action commenced, and there was a very considerable loss on their part. As far as I know of the proceedings that were adopted by the governor at Colombo, on receiving intelligence of this outbreak, I believe that they were to direct a concentration of troops, for the reinforcement of the force at Kandy, from all parts of the island where they could be spared. There were troops at Matelle, at Kurnegalle, at Dambool; there was a large force marched from Trincomalee, in the direction of Kandy; there were troops sent to Badulla, considerably to the eastward of Kandy; and in every direction there was such a force assembled, that if, unfortunately, the first endeavors of the insurgents had been successful, every means were taken that it was possible to take with the force which the Ceylon government had at its disposal, to have restored order, and if any portion of the country had been lost, to have recovered it. I think it would have been impossible to have made more of the military means at the disposal of the governor than he did make of them. The measures which were taken by the government, independently of these measures, were simply the proclamation of martial law which was issued I think about the 30th of July. There were two proclamations; one of them, as soon as intelligence of the affair at Matelle reached Colombo, the other as soon as intelligence arrived of the affair at Kurnegalle. Kurnegalle not being within the central province, to which martial law was confined in the first proclamation, it was necessary in consequence that a second proclamation should be issued.

With regard to the proclamation of martial law, in my opinion, in the island of Ceylon it was absolutely and indispensably necessary. I imagine it would have been utterly impossible to have put down an insurrection with any vigor if there had not

been prompt and vigorous measures taken, such as the proclamation of martial law, to enable some authorities to dispose of the most atrocious cases which were brought before them instantly and on the spot. With regard to the severity of the measures, I procured from Colonel Drought, before I left Kandy, a list of summary punishments which were inflicted while martial law was in force. This list includes not only the punishments inflicted for rebellion, but also the punishments inflicted for all manner of offenses, for the civil courts were in abeyance, and the entire police and civil administration of the country was in the hands of the military for about 10 weeks. It appears from this list that there were four places where courts-martial sat during the greater part of this period. They sat at Kandy, at Matelle, at Kurnegalle, and at Dambool. During the whole period of those ten weeks there were executed, by the orders of the courts-martial, 18 persons; one was transported for life, 17 were transported for 14 years, one was transported for ten years, nine were transported for seven years; there were 42 imprisoned with hard labor; there were 30 imprisoned with hard labor, and subject to corporal punishment; there were 28 received corporal punishment alone; that makes in the whole 146; that is the extent of the punishments. Those punishments were all inflicted by courts-martial. During all this time, civil law was in abeyance in that part of the country where martial law was proclaimed. Where the insurrectionary movement had taken place excepting that for a short portion of that period of 10 weeks a portion of the town of Kandy was, either by another proclamation or by an act of the legislature, exempted from the action of martial law, to enable the chief justice to go and hold his court there, and sitting when the military tribunals were sitting. The district or place in which the court sat was exempted from the operation of martial law, with a view to allow the exercise of civil jurisdiction concurrently with martial law, in the other districts in which martial law prevailed. The exact limits of the district that was exempted from the operation of martial law I do not know, but they were limited I believe. The civil court was sitting trying offenses which were connected with this rebellion; in fact they were generally trying those persons who had been taken prisoners in the first fight at Matelle, and immediately subsequently to that, but before the date of the proclamation of martial law in those provinces. For although one of the objects of proclaiming

martial law was to provide the means of summarily trying those concerned in the insurrection, and of course those taken in arms and in open rebellion, there were legal doubts entertained of the power of courts-martial to try any prisoner accused of offenses committed before the date on which martial law was proclaimed. It was therefore deemed expedient to issue a special commission to the chief justice, for the trial of all persons accused of treasonable practices before the date of the proclamation. That civil court was not trying prisoners for offenses committed at the same time as those for which the courts-martial were trying prisoners, it was especially formed for the trial of those persons who could not be brought to trial, according to the interpretation given by the law authorities who were consulted, before the courts-martial. Offenders tried by the civil court were those who had been arrested previously to the proclamation of martial law, the offenders tried by courts-martial were those who committed offenses during the operation of martial law, subsequently to the issue of that proclamation.

The only persons I know of, who ever made very strong objections to the continuance of martial law, were the proctors of the courts; they said that the whole of their business, which was their livelihood, was stopped; there were no courts opened; there were no fees paid; there was no business doing; but I never heard that any class of people, except the proctors, objected particularly to the continuance of martial law. I never heard any one advocate its continuance as a permanent system, although I find by a memorandum I made when I was in Ceylon, that on one particular occasion martial law was in force in the Kandyan country for upwards of a year. In the year 1818 martial law was proclaimed on the 21st of February, and it continued in force until February the 12th, 1819.

Another proclamation has been referred to, dated the 8th August, 1848: It is hereby proclaimed that in all the Kandyan districts now under martial law, I have ordered the seizure and attachment of lands, houses, and other property, of all the persons, of whatever rank or description, who have joined in the wicked rebellion against the authority of Her Majesty the Queen; and I hereby call upon all loyal subjects to assist the officers appointed by me to carry my orders into effect. And I hereby further command all loyal subjects of Her Majesty the Queen to keep themselves apart from those concerned in this rebell-

ion; for whosoever shall be found to have aided the rebels, or supplied them with food or other provisions, is liable to condign punishment, and will forfeit his lands and property, and will be treated in all other respects as a rebel. And I also hereby declare to all innocent and loyal subjects who may chance to be absent from their houses, but who have not been engaged in any act of treason or robbery during the present insurrection, and can account for their absence, that they are not, by this my proclamation prohibited from returning to resume possession of their property, and reside in peace in their houses. Signed by T. A. Drought, Lieutenant-Colonel commanding the troops in the Kandyan provinces. That proclamation met generally with my concurrence, I looked upon Colonel Drought at that time as possessing absolute and unlimited power, under the proclamation of martial law, over the lives and property of the people; and I considered that it was very desirable that a proclamation of this nature should be issued, warning all loyal subjects of the danger of remaining absent from their homes, and giving all an opportunity, by returning, of clearing themselves from any suspicion which might have attached to them in consequence of their absence. Part of this order, relating to the seizure and attachment of lands, houses, and other property, is quite in conformity with what I believe has always been a part of a course pursued by the government of India in suppressing rebellion there. The confiscation of property, and particularly of landed property, has been one of the main engines which has been directed against the insurgents, and particularly against those of rank and authority, who are engaged in a rebellion. It appears afterwards that there was a demur upon this point; and that as the English law understood by some authorities to prevail in the Kandyan provinces, it was supposed that this seizure and attachment would be of no avail, because it could not be extended to permanent confiscation simply for the want of an attainder; and that no attainder would follow even the death in battle, in front of the queen's troops, of any of those rebels, or their falling by the hands of the hangman under martial law; but that their blood would not be attainted and their estates would not be escheated, unless they had been tried by the ordinary courts of law. I said that an opinion had prevailed on the part of some authorities, that the English law prevailed in the Kandyan provinces; because I have been informed that all lawyers do not agree in that opinion, some argu-

ing that if any law of the land prevails there, we should recognize the Dutch or Roman law.

The proclamation was issued, I may say it was by my advice as well as by my concurrence; I considered this a suitable warning to give. I considered that Colonel Drought was supreme, and that he was justified in adopting any measures whatever which he thought most likely to bring the insurrection to an early close. I certainly was of opinion that this order of his was well calculated to secure that object.

After the Supreme Court commenced its sittings, it was considered unwise to abolish martial law as long as there were any bodies of the rebels remaining collected, and as long as the pretender remained unapprehended that at one time was the opinion why martial law was continued in force.

The Supreme Court I believe assembled at Kandy upon that occasion under a special commission; what the terms of that commission were I cannot say, but of course they would limit its jurisdiction. But I may take this opportunity of mentioning, with regard to martial law, that there was a very strong desire on the part of the majority, if not all, the European settlers in the central province that martial law should not too hastily be discontinued. With respect to the man who was found guilty and shot immediately, I believe that the sentence was carried into effect without waiting for Colonel Drought's confirmation, and that that was the case at Dambool and at Matelle, as well as at Kurnegalle, and that the officers commanding at all those stations received authority to carry into effect themselves the sentences of the courts.

That would be the usual form of courts-martial in the field in an enemy's country, but it is not the custom of courts-martial within our own peaceful boundaries and in our own cantonments.

Ques. At the time that those courts-martial were sitting in Kandy, was not it in our own possession, and in perfect peace and quiet?

Ans. I imagine that the existence of martial law infers the existence of a state of things which requires the severe discipline which must sometimes be enforced in an enemy's country.

Ques. You admit that the district of Kandy, then not in possession of an enemy, was treated as an enemy's country would be?

Ans. I did not say anything of the kind. I explained the course of proceeding; that authority was given to the officers un-

der whose orders the courts-martial were assembled at other places besides Kandy, to enforce the sentences upon their own authority; and such I believe to be the case with officers commanding detachments in a foreign country in time of war. I have always conceived that the term martial law is merely meant to convey the idea that the military officers who are in possession and who are ruling the district are themselves the judges. I imagine that martial law does not require an adherence to the rules of the Mutiny act, or any other set of rules. But on the late occasion of the enforcement of martial law in the Kandyan province, it was considered desirable to instruct officers to proceed, as far as possible, according to the ordinary forms which would have guided them if they had been sitting on ordinary courts-martial at any other period.

Colonel Drought received his instructions, which had regard to the peculiar state of the country, and the duties which devolved upon him in consequence of the proclamation of martial law, direct from the governor, but that he continued to receive his instructions relative to the discipline of the troops, as under ordinary circumstances, from the commander of the forces; that I believe to have been the case. Everything relating to the suppression of the rebellion, and the measures taken for that purpose, came to him direct from the governor, without the intervention of the general commanding the forces.

The people of Ceylon enjoy the right of trial by jury; that is not the case with the people of India. As to the people of Ceylon, I consider that either they or the inhabitants of India, when they have broken their allegiance, have forfeited all claims which they could possibly have upon the British government resting on the condition of their loyalty, and that martial law was warranted on that account. There was every manifestation of rebellion that is necessary, in my opinion, to deprive subjects of any terms which they may have originally obtained from the government.

Sir David Dundas.—I have held between two and three weeks the office of judge advocate general, as to proceedings of courts-martial held in Ceylon in the year 1848, in my office after the proclamation of martial law. There are none. What have arrived to-day are the proceedings of a court-martial under the Mutiny act, effect of proclamation of martial law on the inhabitants to put them under it.

If I might be permitted to say a few words here, it may possibly clear the ground. It is necessary to distinguish between military or martial law, as it is sometimes called. Military law is the written law to be found in the Mutiny act and the Articles of War. Those, and those alone, it is by which the land forces of her majesty are regulated; those, and those alone, it is which are, properly so called, the Military Code. Martial law, is not a written law; it arises on a necessity to be judged of by the executive, and ceases the instant it can possibly be allowed to cease. Military law has to do only with the land forces of the crown mentioned in the second section of the Mutiny act. Martial law comprises all persons; all are under it, whether they be civil or military.

There is no practice under martial law laid down in any book that I know; martial law, when proclaimed, must be executed by those who have to execute it, firmly, faithfully, and with as much humanity as the occasion allows, according to the conscience and good sense of those who have to execute it. As to powers which are given where martial law is proclaimed though you may find definitions upon the subject, as for instance, where Blackstone speaks of martial law, you would hardly find it safe to be guided by those definitions. I have a reference here to what Blackstone says upon the subject, but I think it would not be safe to say that that was a definition of martial law. The difficulty of those definitions arises very much from the words "martial law" being taken to mean the same thing as "military law." You will find in the first section of the Mutiny act, in the preamble, the expression "martial law" employed evidently meaning military law, and not martial law. The reference to Blackstone will be found in Commentaries, Vol. I., page 412, where he says: "For martial law, which is built upon no settled principles, but is entirely arbitrary in its decisions, is, as Sir Matthew Hale observes, in truth and reality no law, but something indulged rather than allowed as a law. The necessity of order and discipline in an army is the only thing which can give it countenance." I say, that Justice Blackstone and Sir Matthew Hale, here are referring to the discipline in an army, and therefore in my humble apprehension their language must apply itself to military law. "And therefore," he says, "it ought not to be permitted in time of peace when the king's courts are open for all persons to receive justice according to the laws of the land." I do not mean to say

that the proclamation of martial law deprives all her majesty's subjects of the ordinary means by which their innocence may be proved and protected. The proclamation of martial law is a notice to all those to whom the proclamation is addressed, that there is now in the land another measure of law, and another mode of pursuing it, than there was before that proclamation. As martial law can only be justified at the time on account of the necessity for the public safety, no man who is at that time taken as an offender can choose the tribunal by whom he shall be tried.

The mode of proceeding under the Mutiny act and the Articles of War is pointed out by the Mutiny act; the number of the court the mode of conducting the business of the court, and the deputy, judge advocate, or some such person, are all mentioned in the Mutiny act; but under martial law I know of no such provisions, though I consider any person prudently exercising martial law, under the authority of the same, would, if opportunity were given to him, make some notes of the proceedings.

As to the preamble of the Mutiny act: "And whereas no man can be forejudged of life or limb, or subjected in time of peace to any kind of punishment within this realm, by martial law, or in any other manner than by the judgment of his peers, and according to the known and established laws of this realm." I do not think that that is tantamount to a legislative declaration that in time of peace the crown has no authority to proclaim martial law. I consider the words "martial law" in that preamble to be convertible with the words "military law"; it means the same thing. It is stated that no man can be judged but by the laws of the land; but the Mutiny act sets up a new standard of law, to which certain persons are to be drawn, and those are soldiers. The words "in time of peace"; I believe are words of jealousy. They were not in the first Mutiny act, in the time of William; they were introduced in the time of Anne; and there is a notion that they were introduced rather as words to express jealousy of a standing army, declaring that there ought to be no other mode of trying men than by the known and established laws of the land. But here we have an army in time of peace, and yet, for the sake of discipline, we are going to put it under the Mutiny act.

A soldier would, by what is called the custom of war, be put under a very different law from the common law of the land; and the Mutiny act was in favor of the soldier as well as of the crown.

XUM

By the sentence "that it is desirable that soldiers who shall mutiny or stir up sedition, or shall desert her majesty's service, should be brought to more exemplary and speedy punishment than the usual forms of law will allow"; is tanamount to a declaration that even in the case of soldiers mutinying and stirring up sedition or deserting the queen's service, there would have been no constitutional right on the part of the crown to punish them for such acts, excepting under such powers as are given by the Mutiny act. I think it is, to a certain extent, intended that they should have no excuse; that taking the queen's money and enlisting under her flag, they should receive punishments which were not authorized by the common law; because they knew the bargain they were making, and the law they were to live under.

Supposing by any accident the Mutiny act should not pass till one month after the expiry of the preceding act, and there were a mutiny and insurrection, whether by soldiers or others, and for the public safety it required martial law, the prerogative of the crown is to proclaim martial law, in order to suppress such mutiny and insurrection, and that whether it was caused by soldiers or others.

It might be convenient for the crown, to rely for its justification upon the necessity for that act, and apply forthwith to parliament for an indemnity, because in governing a country like this the crown should never exercise the prerogative royal in a manner unusual without the assent of parliament, if it has time to get it; but I can imagine cases involving the safety of the realm arising from time to time in which you would be bound to exercise another law than that which you could get from parliament, and that is the law which in my opinion is among the prerogatives of the crown, namely, martial law.

Supposing during the disturbances in Ireland, in the year 1846 there had been opposition offered to the police and the queen's troops, and that her majesty had been advised to proclaim martial law, supposing under that proclamation a person had been apprehended, and supposing that person, being apprehended under martial law, had applied for his habeas corpus to the Court of Queen's Bench, I think the Court of Queen's Bench would have considered whether under the law martial, supposing it were properly at that time the law of the land, this person could be apprehended and detained, as he was apprehended and detained;

and if they thought he was a person under martial law at the time they would remand him to the proper custody, they would not discharge him if he was at the time under martial law. I think they would recognize martial law.

You are putting a case, however, which can hardly occur. In 1798 martial law was proclaimed in Ireland. There was an act of parliament at that time enabling the lord lieutenant or other commissioners named in the act to proclaim martial law in different districts; but if I do not forget myself there was a plain recognition of the prerogative of the crown to proclaim martial law. I know the prerogative of the crown is asserted in that act, and I consider that the act of parliament in that particular case, acknowledging the authority royal of the crown in these matters, is an assurance to the country that the crown will always, when it has an opportunity, come to parliament for a confirmation of its own authority, and then proceed according to the law. But an emergency may arise where there is no parliament to refer to, where the necessity is thrown absolutely upon the executive, which must decide for itself then and there upon the necessity; and if there be such a force as to set at defiance or upset the constituted authorities of the realm it is the duty of the executive, and I think there is authority royal in it to do so, whether at home or abroad, to put it down.

I conceive that parliament would undertake to determine the question whether the executive had exercised a wise discretion. I conceive a court of law certainly might also do so. I can imagine a case where martial law was proclaimed, in which a person might do something which no necessity can justify; as, for instance, to put the case of torturing a child; I conceive that never could be justified.

Question. Are you not now speaking of the moral justification of the crown in a declaration of martial law, upon some given necessity which parliament would recognize and for which it would be willing to give the crown indemnity? Is not that a perectly different question from the question whether a court of law would recognize it? Do you conceive that the Court of Queen's Bench would inquire whether there were a sufficient justification of a proclamation issued by the crown; would not the Court of Queen's Bench declare, either this is a proclamation with which we have no concern, and which we will not recognize; or, if it took a different course, would not it recognize the mere

fact of the issue of the proclamation, without regarding any inquiry into its necessity as obligatory upon it?

I think it would recognize the existence of martial law under the authority at the time. I will not refer to the proclamation; I do not know whether the proclamation is absolutely necessary; it is, in truth, merely a mode of allowing the persons who are to be brought under this new form of law an opportunity of knowing the law they are living under; but I apprehend that without that notice the law might be put in force in certain cases of extreme necessity.

I can imagine, for instance, what was proposed in Governor Wall's case: Governor Wall was tried for the murder of a soldier, by inflicting upon him by his own authority, with some sort of drum-head court-martial at the moment, 800 lashes. The man died. Governor Wall, as we know, was brought to trial for it 20 years afterwards in London. Lord Ellenborough, then attorney-general, said that if the army of which the soldier man was a part were at the time in such a state of mutiny and insubordination that recourse could not be had to the ordinary forms of law contained in the Mutiny act and the Articles of War, and that for the safety of the state the governor adopted the violent remedy which was there adopted, there might be a defense for him in point of law; and to that opinion, it appears to me, Chief Baron Macdonald, who tried the cause, seemed to come and so I would say; wherever martial law is exercised under authority of the crown or the representative of the crown. It is not fair to put a case as if it were in England, where you have the power of coming to parliament, and getting authority from parliament; but I would put the case of its happening in a colony, where the governor is obliged to act upon his own resources, with the advice of his executive council, and where there are not the same means of obtaining advice as in this country; he has to refer to such counsellors as he may have about him, and after all he must judge of the necessity upon his own responsibility. If he fairly and truly believes that the civil and military power which is with him, and such assistance as he might derive from the sound-hear of the queen's subjects, it is not enough to save the life of the community, and to suppress the disorder, it is his duty to suppress it by this or any other means, in a case of the greatest necessity, where the other means in his power are insufficient.

Question by Sir R. Peel. I am not speaking of a necessity

under which the government may be to proclaim martial law, which may be recognized by parliament, or for which parliament would be willing to give an indemnity; I am supposing a case of a profligate or tyrannical government having a plausible pretext for it, proclaiming martial law, and that a man was apprehended by military authority and subjected to detention, and that that took place in time of peace. I am inquiring whether the Court of Queen's Bench would respect the proclamation of martial law, or whether they would not at once give to the person so detained the benefit of habeas corpus?

You are putting me a question which drives me almost to the position of saying, shall we stand by a revolution, or shall we make it? If there was a mere tyrannical pretext for martial law, made upon no justifiable occasion and with no necessity whatever, I doubt very much if there would not be found bold-hearted men in Westminster Hall to pay no obedience to this martial law. But if it appeared to the Court of Queen's Bench that there was *bona fide* existing martial law, I am of opinion that the Court of Queen's Bench would not discharge on habeas corpus or hold it murder, where in the exercise of the authority confided to him under martial law, a man put a rebel to death.

The courts when martial law is proclaimed would have no jurisdiction except in a case as that happening to be brought to the cognizance of the Court of Queen's Bench; but that might be six months after martial law had ceased to operate. I will not suppose the government to be actuated by corrupt motives, but that in a moment of perfectly exaggerated and unnecessary apprehension they had issued a proclamation of martial law, and that a person had been detained under that proclamation I think the Court of Queen's Bench would have considered the mere proclamation to be decisive, and to have ousted them of their jurisdiction and in the case of Ireland, in the Act of 1798 I rather think there is a special provision as to that matter. I consider the preambles in that act of parliament as recitals of the law of the land.

Martial law is no more, in my opinion, than what is due to the persons upon whom the law is to be inflicted; it is giving all good persons an opportunity of getting out of the way, and all bad persons an opportunity to reform. The effect of proclaiming martial law is to suspend the constitution.

There have been instances where martial law has been pro-

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claimed in several of the colonies; it has been proclaimed in Jamaica; it has been proclaimed at the Cape of Good Hope; it was proclaimed at Ceylon in the time of General Brownrigg. Those were cases where I understand there was no appeal to any parliament, properly so called, unless it was in Jamaica; as to which island I believe there was an act of parliament to govern the question. In the other instances, the executive acting for the public safety, did the best they could. I think that a wise and courageous man would, if it were necessary, make a law to his own hands, but he would much rather take a law which is already made; and I believe the law of England is that a governor, like the crown, has inherent in him the right, when the necessity arises, of judging of it, and, being responsible for his work afterwards, so to deal with the laws as to supersede them all, and to proclaim martial law for the safety of the colony. I think a good man will do it with very great care; and a prudent man too, but a wise and courageous man, I think, ought not to be shy of doing it, he is responsible for what he has done, just as I am responsible for shooting a man on the king's highway who comes to rob me. If I mistake my man, and have not, in the opinion of the judge and jury who try me, an answer to give, I am responsible.

Martial law, or the power of suspending all law in cases of great public urgency, is inherent in the prerogative.

The governor of a colony, representing the crown, can exercise the selfsame power as the crown itself, if the urgency and necessity of the case justify it. Parties so acting in the event of having to defend their conduct, would have to justify themselves by the law under which they acted, the law under which they acted being martial law. Whether the authorities who set it going had a right to do so, is another question. The constitution provides the power of settling by an act of indemnity. An act of indemnity is of course a prudent measure at all times. Whenever you overstep the law, I recommend you to obtain an act of indemnity if you can get one; but I am not sure that an act of indemnity is necessary. I think it would be wise for a governor who has proclaimed and executed martial law, to have the sanction of his sovereign for his act, and it would be prudent for all persons who have acted under such a law to have an act of indemity. It is a short answer to any persons who ask you questions about your conduct during the time martial law existed.

All preambles are in a sense the key to the act of parliament. I do not see why you should attribute more now to them than in the time of Queen Anne. My opinion is that though those words be in this act of parliament, namely, "in time of peace"; if during time of peace there does arise such an exigency and necessity I suppose, the crown's right, or the right of the person who ought to exercise it for the public safety, at once arises. My attention had been drawn to the preamble merely to see whether the words "martial law" there did not help to confound the distinction between military and martial law.

The proceedings regulated by the Mutiny act are not sufficient for every court-martial, the court-martial therefore keeps as near as it can to the rules of the common law of England. For example, there is no particular method prescribed of taking evidence; you must go by some rule, and you go to the courts for your example. In such an extreme exercise of the power of the crown in any district, I know of no rule, except the rule of common sense and humanity. A man executing the law under a court-martial must go by something; he must go by the evidence. He goes by a shorter mode of taking evidence, very likely, than he would do in a court in Westminster Hall. The conduct of proceedings where they take place under martial law, I think is altogether *lex non scripta*, civil tribunals are suspended, and military tribunals are established.

All tribunals under the Mutiny act consist of soldiers only.

Question. Where military tribunals are substituted for civil tribunal for the proclamation of martial law, are not those tribunals also presided over by soldiers?

I cannot answer the question, because I know nothing of the practice; but in my opinion they need not be. I am clearly of the opinion that all good citizens are called on to take part with the power, which we will suppose a righteous power, in case of necessity.

Question. Did not you refer to some authority for stating that martial law is no law?

I referred to the authority of Blackstone. I do not think, however, in that case Mr. Blackstone's authority is a safe authority for you to rely on for a definition. I think it is more referable to martial law, than it is to the law under the Mutiny act and the Articles of War; but I think to neither is it very appropriate.

My notion is that martial law is a rule of necessity, and that when it is executed by men empowered to do so, if they act honestly, rigorously, and vigorously, and with as much humanity as the case will permit in discharge of their duty, they have done that which every good citizen is bound to do. I think that in every such emergency the crown would be well advised to have parliament at its back; in a case so difficult to lay down a rule for as martial law, where, as I say, nothing is written, it would be wise of the crown, if it had time to do so, to prescribe the mode and the measure of the administration of that law, which would prevent difficulties which otherwise might arise; but I am not prepared to say that in a country where you have no time to do that, where you have no parliament to apply to, where you are, as the executive bound to suppress the disorder or lose your power altogether, you must resort to any proclamation even of the means and manner in which martial law is to be executed.

Parliament if necessary, will give them an indemnity; and parliament ought to give them an indemnity, for this reason, that it is a short answer to any question afterwards. I have some quotations from an act of indemnity in which appears this clause, "Provided always, and be it declared and enacted, that nothing in this Act contained shall be construed to take away, abridge, or diminish the acknowledged prerogative of his majesty, for the public safety, to resort to the exercise of martial law against open enemies and traitors." That is a confirmation of my view.

If that paramount necessity existed, and in the opinion of a court of law existed at the time of an act done which was justified by it, they would hold that justification a sufficient answer in law, but if they had exceeded the necessity of the case, or proclaimed martial law without that necessity, unless there were an indemnity the court would hold the parties responsible for the act, therefore it is a prudent measure to obtain an act of indemnity if it can be obtained, in order to cover any excess; but where a necessity has clearly existed, that act of indemnity is not absolutely required. The act of indemnity would be the more valuable, inasmuch as it would have the effect of showing also, to a certain extent, that the legislative body, whatever their opinion was worth, had recognized the necessity of martial law in the country, but they must answer for their own opinions. The executive must be responsible for its own work, and that is a work so very far beyond the usual course of law that unless the execu-

tive can answer for it with a good conscience and with safety, the executive will get into great trouble.

I apprehend that if a man, without reasonable necessity for it, were to proclaim martial law, he ought to be brought into very great trouble for it.

The supreme courts in Ireland sat and tried cases at the time when martial law, under the act which had been referred to so often, was actually in operation. I think, if a well-constituted government should find that certain of its courts, whether civil or criminal, can carry on their business properly and to the satisfaction of the country, at the time when martial law is proclaimed within their jurisdiction, there is no reason on earth why those courts should not do their work; at the same time, it is a matter which depends so much upon circumstances, that I would rather not state more.

In this act of 1798, which has been so frequently referred to, it is recited, among other things, that "peace and tranquillity have been so far restored as to permit the course of the common law partially to take place; but the said rebellion still continues to rage in every considerable part of this kingdom"; the view that the effect of martial law in a sense suspends the operations of the ordinary tribunals; but I am not prepared to say that martial law having been proclaimed the ordinary tribunals may not proceed according to the ordinary course of the common law or the statute law of the land.

This reference of the state of Ireland being such as to authorize the general application of martial law, with the exception of a partial continuance of the civil courts, rather confirms that view.

Under that act of 1798 particular districts of the kingdom were placed under the operation of martial law, and others were not. My opinion is that it is the undoubted prerogative of the crown to proclaim and execute martial law when necessary, and that when that necessity arises it is the duty of the crown, for the safety of the state, to do that, which is the only thing which can be done in such a case, to save the country.

With reference to the act of 1798, which established martial law in Ireland, it appears that Lord Camden, who was then lord lieutenant, did, on the 24th April, 1798, proclaim martial law. By the subsequent section, it appears that parliament then adopted that proclamation as it were, and gave a parliamentary sanction to the proclamation of the lord lieutenant.

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By the oath, officers sitting on courts-martial under the Mutiny act, are bound, if any doubt shall arise which is not explained by the said articles or act, to act according to their conscience, the best of their understanding, and the customs of war. My own opinion is that an officer cannot go very wrong who adheres as closely as the circumstances will permit him to the mode of administering the law under the Mutiny act; and if he will take the latter part of the oath taken under the Mutiny act it appears to me to afford him a very safe and honest guide in such a critical case. I consider that martial law might be proclaimed and orders given by the executive to carry it into execution in a given manner, and then he would be bound to carry it out in that manner, in my humble judgment.

RECRUITING AND TRAINING OF THE COMPANY.

By Lieut. CHARLES MILLER, 11th U. S. Infantry.

(*Continued from* Journal *No. 76.*)

II. DISCIPLINE.

IN the armies of Europe habits of discipline and the unquestioning obedience of inferior to superior are matters of easy accomplishment, for class distinctions come strongly to the aid of military necessity.

"Discipline in fact, is a union of very different qualities, each of which is an important element in war. It means cohesion of the units and subtleness of the mass—it means increased firmness and increased flexibility, it means the most efficient combination of many and various parts for a common end" (Hamley).

Discipline is the keynote of every success in war, and obedience to orders is the vital principle of military life—the fundamental rule of discipline in peace as well as in war. This rule the officer finds recited in the commission which he accepts and the soldier in his oath of enlistment swears to observe it. We seek to discipline the soldier by instruction, punishment, reward, practice or force of habit and by awakening the feeling of patriotism.

It is to the company officers whom we principally look to discipline the soldiers. These officers fully realize this and are as a class, at all times ready to accomplish all that can reasonably be

desired or expected. But only too often all their efforts are frustrated and their province of authority is unnecessarily invaded.

The present state of discipline in the army leaves much to be desired, as those who are in immediate contact with the troops well know. Snch matters are not usually so apparent to higher authorities. But I venture to assert that it is not the company commanders or the company officers who are responsible for the present state of discipline. Recent legislation, calculated to better the enlisted man's lot, cannot be said to have improved the morals and discipline of the troops. The opinion of regimental officers, to whom we look for the efficiency of the companies and battalions, should be considered deserving of consideration in proposed material changes affecting the status of enlisted men.

The following table shows the number of discharges from all causes by special orders from the A. G. O. for five years, commencing with 1889, following it with a statement of the number of desertions in each year, commencing with 1887, and the total losses from all causes, including desertions for the years from 1887 to 1892, inclusive:

Year	Fraud.	Favor.	Minority.	G. O. 81. A. G. O. July 26, 1890. Purchase.	G. O. 81. A. G. O. July 26, 1890. Veteran	G. O. 80. A. G. O. 1890	Other Causes.
1889	190	322	226	....	.....	.....	216
1890	478	400	173	276	167	.....	157
1891	349	86	150	823	262	1,594	124
1892	351	106	170	992	150	1,775	122
*1893	264	64	56	1,788	136	700	104
Average	326	163	155	970	179	1,356	145
1893.							
January	12	2	5	116	5	153	11
February	24	4	7	137	14	12	9
March (up to 20th	20	7	1	129	10	7	4

	Desertions.	Other Causes	Total
1887	2,382	.....	.....
1888	2,598	.....	.....
1889	2,693	954	3,647
1890	1,893	1,651	3,544
1891	1,398	3,338	4,786
1892	1,410	3,666	5,076

These figures show that the total losses to the army from all causes had decreased in 1891, the first year in which the new

*Estimated on the basis of the returns up to March 20, 1893, as given above.

General Order took effect, about one-third as compared with 1889. Last year the increase as compared with 1889 was almost forty per cent., and this year it promises to be about the same as in 1891.

It appears that the gain from decrease in desertions is much less than the loss resulting from the invitation extended to the enlisted men to leave the service whenever the whim takes them. It will be seen that the total loss to the army from all the causes named in the above table were in 1892 nearly forty per cent. in excess of the number in 1889.

Swift, certain and severe punishment should follow the crime of desertion. Transfers of other men to other companies or regiments should be very sparingly granted and then only for good reasons. Company commanders should have it in their power, by proper representation of the matter, to have undesirable and worthless men discharged without having to adopt the slow and uncertain process prescribed now, requiring a certain number of convictions by courts-martial; and as has repeatedly happened, when discharge has finally been imposed by the court, have the reviewing authority at a great distance from the post decide that the case in question is one for discipline rather than for discharge and disapprove the sentence of the court.

In order to secure discipline the commander must constantly feel the moral pulse of his men. An economic use of his power is essentially necessary;—a tightening and loosening of the reins, not violently, but with a constant preservation of the touch; strictness or severity and forbearance or indulgence at the right time; to apply both at the wrong time may be hurtful.

Continual forbearance becomes weakness, mediocrity, and will be abused and laughed at. Ultimately indulgence leads to injustice, for at the end offenses must be punished which have before been left unpunished; it produces laxity of discipline while constant praise has a tendency to spoil the men and weaken their energy; an eternal belittling and finding fault with produces dissatisfaction and a show of disinterestedness. When a man can never give satisfaction he soon loses all courage and interest. Blind confidence is just as much out of place as constant suspicion; the correct parole is: confidence and control.

Long talks untimely made tire the men, while a fitting word —whether serious, harsh or friendly will often work wonders.

The men should be made to realize that severity is only made

use of to promote the best interests of all. Great patience is required. In order to use man's natural egotism as a spring one must never tire with promises, rewards, praise, persuasion, cheering up, encouraging and inciting, admonition, instruction, remonstrance, correction, censure, command, prohibition, reproof, threats and punishment.

In the use of these a constant preservation of respect for the men and their rights is necessary—strict, impartial justice,—and the means employed must with fine tact be suited to the requirements of the individual and also of the company.

With the individual man it must be considered whether he has offended from ignorance, limited understanding, awkwardness, rashness, frivolity, indifference, indolence or from a base mind and with bad intentions. Even excessive zeal can do mischief.

It should be considered whether the man is sensitive to punishment or to certain kinds of punishment; whether he sees in them an act of revenge or feels his sense of honor wounded and changes his good will to stubbornness—or whether he is susceptible for punishments or for certain kinds of punishments, *i. e.*, expects them periodically to remind him of the right way he ought to go.

It is difficult in all cases not to commit an error of either "too much" or "too little." The only true guide is tact.

As sins of omission are the most numerous, indolence must be energetically driven, a sense of responsibility must be educated in the man.

It is of the utmost importance to apply the means for discipline at the right moment and to do this an uninterrupted control is necessary. Also in order to guard against lax ideas and to fill the men with a sense of the "sacredness of commands and orders," and to instill in them unconditional respect for the same, it is necessary (if doubtful of the execution) only to command or forbid what can be controlled and what is necessary. He who commands too much and too often brings on the disobedience of those who are to be led. Finally commands should only be given where obedience can be enforced or where the commander is ready eventually to personally step in for his order.

A feeling of confidence and good will should exist between the officer and the men, but care must be taken by the former not to waste any on the undeserving. The first means to obtain the

love of the men is: "Love your men first." The man's instinct does not allow any deceit to be practiced on him by a pretended interest and good will on the part of the superiors.

The veracity, candor and frankness which the man shall learn must be offered by the superior.

Being constantly in touch with the men, being familiar with their lives, their habits and necessities will suggest the proper mode of governing them. Danger in such constant touch does only then exist when the officer is not himself a shining example or where he approaches the men's level of education. Here this constant touch had better be sacrificed. The soldier must look up to his superiors.

Assistants to the officers are the non-commissioned officers who act by authority and under direction of the chief. These must be carefully chosen and properly trained. All characteristics which make a company efficient must be possessed by them. They must enjoy the confidence of the men and the officers. An independent sphere of action should be assigned each non-commissioned officer where the superior does not interfere without necessity so that they may become intelligent co-workers of the officers.

3. PUNISHMENTS.

The institution of a summary court and a prescribed uniform limit of punishment for specified offenses has been a step in the right direction in the administration of justice in the army, but more can still be done. The trials by inferior courts have been far too numerous as is shown by the following table:

Year.	No. trials by		Total.	Strength of Army.	Increase or decrease in No. of trials as compared with preceding year.
	Gen. C.-M.	Inferior C.-M.			
1888*....	1692	10,447	12,139	26,881	.....
1889.....	1961	11,581	13,542	27,519	+1403
1890.....	1748	11,574	13,312	27,105	— 230
1891.....	1878	15,140	17,018	26,174	+3706

That trials by inferior courts are too numerous has been realized by the War Department and company commanders have been advised to work towards a reduction of the number of such trials by resorting to measures of punishment already within their power, such as denial of favors, restriction of privileges, etc.

Why not go a step farther and constitute the company com-

* Year ending September 30. In 1892 the number of trials has been still greater.

mander a summary court in his company with limited powers of punishment. He is responsible for the efficiency of his command, he knows each individual man by name, is more or less familiar with his character and has certainly the best interests of the company at heart because his efficiency is judged by the results of his labor, *i. e.*, the state of his company.

The power to punish should be an incident of office not of rank and begin with the commander of the smallest unit.

Military punishment is more fruitful in its results by the rapidity with which it follows the commission of an offense than either by its certainty or severity; but to derive the maximum result the three factors should be combined.

If company commanders had the power to inflict punishments for minor offenses much less delay would occur than is at present the case. There are a few company commanders (of the old school) who have tried this system in a mild and limited form with most gratifying results. But we should have the law and the authority of the War Department in this matter and the limit of disciplinary punishments of the company commander strictly defined.

The power of punishment of the company commander might properly be confined to offenses the punishment for which would not exceed the following:

1. For subalterns: Simple and formal reprimands.
2. For non-commissioned officers:
   a. Simple reprimands in the presence of a superior of the particular N. C. O.
   b. Formal reprimands in the presence of all the company officers and N. C. O.
   c. Severe reprimands with entry on Descriptive book—extra guard and company duty.
3. Against privates.
   a. Detail for extra duties such as drill, guard, duty in the company or on the target range, appearing in prescribed uniforms for certain roll calls.
   b. Withholding the pay and turning it over to a N. C. O. to be paid to the man daily for a period from one day to one month.
   c. Imposing of obligation to return to quarters at a specified time before 9 o'clock P. M. for a period of from one day to one month.

Limit of punishment by confinement:

a. For N. C. O.: Arrest in quarters from one to five days (attending no duties).

b. For privates:

aa. Arrest in quarters from one to eight days (attending all duties).

bb. Arrest in guardhouse from one to three days (without labor).

The privates in arrest in quarters should not be permitted to visit the amusement room.

CONFINEMENT IN POST-GUARDHOUSE.

1. Men should not be confined in the guardhouse, especially for the first time, unless absolutely necessary.

2. Soldiers confined and awaiting trial should be kept in separate rooms from men serving sentences.

3. Soldiers awaiting trial or sentence should not be sent out to work under guard.

4. Soldiers in confinement in the guardhouse should not be permitted to have any kind of literature.

Soldiers sentenced to hard labor should be subjected to "hard" labor.

IV. PAYMENTS.

The pay of the N. C. O. to be such as given under the subject of "the N. C. O."

That of the privates to be $10.00 per month for three years and $150.00 at time of discharge, if honorable.

The former bi-monthly payments have very wisely been followed by monthly payments, but more frequent payments than that even seem just and advisable.

The law in regard to time of payments in the English, French and German armies is as follows:

English Army: "The pay of N. C. O. and army men shall, when practicable, be issued weekly in arrear, and in the event of a soldier misconducting himself, such soldier may be ordered by his commanding officer to receive his pay daily." (Royal warrant for the pay of the army.)

French Army: "The pay of the men is fixed by the day and is drawn in advance by the regimental paymaster on the 1st and 16th of the month. It is paid to the captains on the 1st, 6th, 11th, 16th, 21st and 26th of each month for the number of days

interval between each of these dates." ("The Armed Strength of France.")

German Army: "N. C. O. and men receive their pay (the month reckoned at thirty days) in advance on 1st, 11th and 21st of each month." ("Armed Strength of Germany.") The above extracts show that the German troops are paid tri-monthly, the French army every five days and in the English service weekly payment is the rule.

If in armies from 250,000 to 500,000 men strong such frequent payments are possible, we should not find it difficult to adopt the tri-monthly payments with a force of 25,000 men.

Frequent payments are in accord with the usage of all commercial and industrial corporations. In the Treasury Department payments are made weekly, in the War Department every fifteen days.

The sections of the Revised Statutes governing payments to the army are as follows:

Sec. 1188. The paymasters and additional paymasters shall pay the regular troops and shall pay all other troops in the service of the United States, when required to do so by order of the President.

Sec. 1189. The army shall be paid in such a manner that the arrears shall at no time exceed two months unless circumstances shall render further arrears unavoidable.

Sec. 1189 simply establishes the outside limits.

Sec. 1188 requires direct payment to be made by the paymaster and should, to make more frequent payments possible, be so amended as to provide that other officers—the post quartermaster preferably—shall receive the necessary funds from the paymaster and invoice the same to the company commanders in such sums as they may require for the payment of their men.

It should be made optional with the men whether to receive the pay tri-monthly or monthly, and they should be permitted to deposit money as now authorized. Final statements to be cashed by the post quartermaster.

V. EXTRA DUTY DETAILS—FATIGUE DUTY.

As a factor detrimental to the best interests of the service, tending to relax discipline and impair the military usefulness of the men, the system of detailing men on extra duty stands pre-

eminent. This is so universally realized throughout the army that little comment is necessary.

The province of the company commander is invaded—increased duties and hardships are thrown on the men of the company not so detailed—and the men so detailed are but poor and inefficient soldiers and as a rule no better as laborers or mechanics. Consequently we deprive the companies of men who should receive military training in order to make poor and indifferent employés in the supply departments.

Congress should create a "U. S. Army Service Corps" under the control of the Secretary of War, to include mechanics, clerks, teamsters, laborers, bakers, cooks, etc.

By this means the combatant arms of the service would be completely emancipated from manual labor, the post fatigue duty being performed by the laborers enlisted for the purpose. The standard of qualification for enlistment of men for the "service corps" can well be much less than that required for the enlistment of the fighting element. A separate and distinct uniform should be prescribed for such a "service corps."

The effective strength of the army would be increased by the return to the ranks for purely military duty of nearly 1700 men and the supply departments would be better served.

6. RECRUITING OF THE HOSPITAL CORPS.

Military training being one of the requirements for enlistment or transfer to the H. C., it was necessary to fill the corps at first with men transferred from the line. The necessity to do so any longer has ceased to exist. The act establishing the corps should have created a training company to be stationed at some centrally located post, where the men enlisted for the corps receive the required rudimentary military instruction and also instruction in hospital service. Transfers to the H. C. should no longer be made because:

1. The companies are deprived of some of their best men often without the approval and consent of the company commanders.

2. Men enlisting with the intention of ultimately transferring to the hospital corps take, while in this preparatory state, the place of a permanent soldier, thereby increasing the work of training and instruction without adding to the efficiency of the command.

3. In place of the man transferred a trained combatant would be returned to civil pursuits at the end of three years.

THE TRAINING PROPER.

1. Theoretical instruction.

In the remarks on the subject of "the education of the enlisted men" I suggested that a course of theoretical instruction might properly be substituted for post-school instruction.

Such a theoretical course should extend through the first two years of the soldier's enlistment and be of an entirely professional nature. In the third year the private should be theoretically proficient. If men are found who are not so, the course for them may be extended through that year also.

Intelligence and knowledge are very desirable qualities for the fighting element of an army to possess, but in order that knowledge may be of the greatest benefit it should be of a practical sort and pertain to the profession.

The theoretical instruction is of course entirely regulated by the captain and carried out under his direction by the lieutenants and such non-commissioned officers as may appear especially qualified for such work.

We have at present no system of theoretical instruction of any kind. I believe the "Soldier's Handbook" is intended for a substitute and if so there can be no doubt that the object is far from being attained for the reasons that:

1st.—The information contained in the book is not sufficient.

2d.—A thorough explanation is necessary in order that its contents may be well understood by all the men.

3d.—The majority of the men will not make themselves familiar with its contents unless compelled to do so.

The soldier's handbook should be revised and its scope enlarged in order that it may be used as a guide (or a sort of text book) for the theoretical instruction of the men. This instruction should cover at least the following ground:

1. Status of the soldier.
2. Object of training soldiers.
3. Duty towards the state—patriotism.
4. Duties of soldiers (loyalty and fidelity—efficiency—courage and bravery—obedience—subordination—execution of orders—honorable conduct—good fellowship).
5. Articles of war.

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6. Military superiors—rank and insignia.

7. Honors paid to superiors—conduct at all times and in all conditions.

8. The interior of the company—regulations for the administration—rules of conduct.

9. Organization of the army—arms of service—divisions—brigades, regiments, battalions, territorial departments—posts.

10. Military government and administration.

11. Pay and allowances.

12. Promotion and status of non-commissioned officers.

13. Applications and complaints.

14. Passes, furloughs—conduct on such.

15. Discipline and punishments.

16. Definitions of unfamiliar terms.

17. Sanitary regulations—the preservation of health in the garrison and in the field.

18. Guard duty in garrison.

19. The rifle, its parts and care of same and also its properties in general.

20. Target practice—its object and the soldier's conduct on the range.

21. General principles of fire discipline.

22. Topographical features, their military importance.

23. Marches:—Preparation—night marches—rests—conduct—cooking in the field.

24. Advance guards—rear guards—flankers (duties of soldier).

25. Outposts (similar to guard duty in garrison).

26. Bivouac and quartering of troops.

27. Reconnaissance.

28. Construction of field-works (duties of soldiers)—works for defense (intrenchments—obstacles).

29. Relation between the civil and military authorities.

This enumeration does not lay claim to completeness but is intended simply to indicate some of the subjects which should receive consideration. The underlying principles could be expressed in a concise form and with few words. No elaborate treatises are intended. The information should be presented in such form as to be intelligible to the ordinary soldier and for this purpose these subjects should be considered from the soldier's point of view and treated accordingly.

Going on the supposition that the term of enlistment is three

years, the whole subject matter can be divided into two courses—a course for the first and a course for the second year of enlistment.

The theoretical course could be carried on principally during the winter months. As a rule, two hours per week would be sufficient to devote to this work, except for the new men during the recruit course which should last three months, three hours per week will be found better, as much repetition is necessary and to give relief from physical exercise, while still employing the time to advantage. The influence which a course of theoretical instruction must have on the practical training would be of the greatest benefit.

II. PRACTICAL TRAINING.

"The demands which war makes upon the troops must determine their training in peace. The tasks of the soldier in war are simple. He must always be able to march and to use his weapon. He can do both only so far as his moral and intellectual qualities suffice and his bodily and military training have been effective. Moreover, his performance will be fully useful only when it is guided by the will of the leader and regulated by discipline." (Extract from German "Felddienstordnung," § 1, 2.)

The ideal here formulated is realized by devoting much time and attention to training and teaching each individual recruit. Next comes the exercise of the company, also as thorough as possible. These two stages of schooling will occupy the greater part of the military year. Then when the companies are perfect they take their places in the battalion.

I will consider this portion of the subject under the two heads indicated by the two stages mentioned above, namely the training of the recruit and the training of the company, with a few words on military gymnastics.

A. MILITARY GYMNASTICS.

By gymnastics we mean a system of exercises which develop and invigorate the body, particularly the muscular system. If properly directed gymnastics will enlarge and strengthen the various muscles of the trunk, arms and legs, will expand the chest so as to facilitate the play of the lungs, will render the joints supple and will impart to the person grace, ease and steadiness of carriage, combined with strength, elasticity and quickness of movement. Plato and Aristotle considered that no republic could be

deemed perfect in which gymnastics as a part of the national establishments were neglected. During the middle ages the tournament absorbed nearly every other sport until the last quarter of the last century when gymnastics were revived and soon extensively introduced into Prussian schools.

About 1810 the system was still more widely spread by Jahn, who may be regarded as the founder of the present "Turnverein." Prussia being at that time impatient under Napoleonic rule, Jahn conceived the project of bringing together the young men for the practice of gymnastic exercises and at the same indoctrinating them with patriotic sentiments which might be made available to expel the French from Germany. The Prussian government favored the plan and in spring of 1811 a public gymnastic school or "Turnplatz" was opened at Berlin which was quickly imitated all over the country. This work bore good fruit in the struggles of Prussia in 1813. The system soon spread and gymnastics were given a prominent place in most European states. There can be no doubt that a state has the right and that it is its duty to promote the physical culture of its citizens.

With us the powers of the Federal Government are often limited by the powers reserved to the States under the Constitution. To benefit the country at large and the army in particular, and in the absence of any better means to accomplish the same results, our army should be made a national gymnastic training school. A system of military gymnastics should be adopted in the army and a course marked out and prescribed as a part of the training of the enlisted men, the same as drill or target practice. As an immediate consequence of such a step the same training would be introduced into the National Guard of the States.

Gymnastics have formed part of the soldier's training in all Continental armies for years past while we have been contented, until lately, with four simple setting up exercises. Efforts are now being made to introduce gymnastic training and the War Department cannot too soon outline and prescribe a course of such training. Officers and men possess the right spirit for the work and the appliances need not be numerous to begin with.

With a course of walking, running, swimming (where possible) the following apparatus would be sufficient: Dumb-bells, Indian clubs, parallel bars, horizontal bars, vaulting horses, spring board, vertical ropes, poles for climbing and ladders.

The question of efficient teachers or instructors need not be

any cause for not at once earnestly entering upon a course. Among the officers and men there are at present many qualified for the work and a year of this training will develop many more. Non-commissioned officers and well qualified privates should be the instructors under the supervision of the company officers.

B. TRAINING OF THE RECRUITS.

In what follows I have assumed that every year one-third of the company is discharged by reason of expiration of term of service and that the company received about twenty recruits yearly. The recruits are received by the company on or just before December 1st.

The company is at its maximum strength and not weakened by extra or daily duty details.

The work is so divided and arranged progressively, that the training of the recruits will be accomplished in three months—at the end of February or in the first part of March, when they will join the company.

It is not my intention to go into details and map out a schedule of instruction. The object to be attained being known, a suitable division and arrangement of the work is soon arrived at—if the underlying principle is once approved and adopted.

Thorough instruction of the recruits is the best guarantee for subsequent good work of the company and all non-commissioned officers should make it a point of honor to give their very best assistance.

The recruits on joining are measured for their uniforms (Recruiting officers do not carry any articles of clothing with them for issue to men enlisted) and fitted out as soon as possible. When this is accomplished the ceremony of "Renewal of oath of enlistment" should take place. This should be made as imposing as possible. The ceremony should take place on the parade, the entire garrison participating, the oath of enlistment being read to the recruits by the adjutant of the command.

It is scarcely necessary to mention what qualifications those should possess to whom the instruction of the recruits is entrusted. Every captain would choose wisely.

The senior lieutenant, as the one with the greatest experience should be placed in immediate charge of the recruits. Two or three non-commissioned officers well qualified for the work should be detailed to instruct the new men and three or four privates,

selected for their military efficiency and good character, should be attached to the squad during the entire course. The moral influence of good men will be very material.

The number of hours of instruction per day should at first be small, say two in the forenoon and one and a half in the afternoon to be increased to five hours per day in the third month.

The recruits should never be allowed to tire of one kind of instruction. The ground which has to be covered in the three months is so extensive that a very interesting schedule of theoretical and practical instruction could be worked out and put into practice.

The bodily or physical and military training should go hand in hand and a judicious combination of gymnasium, drill ground and theoretical instruction should be effected, while the most considerate treatment during this period must be accorded the new men.

A frequent inspection by the captain is necessary to satisfy himself that the work is being done right and to convince the new men that their chief takes great interest in their work and in their advancement.

The final inspection before drilling the recruits with the company is made by the battalion commander. After this the recruits are privates in their first year.

Our present system of training recruits sent directly to the companies, or often also those received from the recruiting depots, is anything but satisfactory. During the entire time of instruction the lack of sufficient interest in the work, and of earnest, unceasing and untiring work is conspicuous. Empty form often crowds out the right spirit. To draw attention to one point only, I will ask, should non-commissioned officers be directed to instruct recruits simply because they happen to be on duty in charge of quarters? or is this work of sufficient importance to appoint permanent, well qualified instructors who will take the proper interest in their work and in the men, and whom the men will learn to know? And yet this is frequently if not usually the case.

Remarks under "Training of the Company" will suggest some modifications in the scope as well as the manner of the present system of training the recruits. As that company which is perfect for the purpose for which intended is our ideal, the men's entire training should, from the first day, be of such a character

and of such a scope as to bring the men as near the ideal as it is possible to bring them in the given time.

C. THE TRAINING OF THE COMPANY.

It is the object to turn out men with as high a physical and military training as three years of hard, earnest and untiring work can produce.

To accomplish this we must work much more than has been the case heretofore.

It may be said that service on the frontier and in the field makes any systematic training impossible. Our small regular army has had and has two separate and distinct missions to fulfill as stated above. The first was and is to constitute a force ever ready and available for service against the savage Indian tribes and for the protection of the American settler and frontier man. The second to form a nucleus which in time of war, can be expanded to suitable dimensions. As the first mission has gradually lost and is still losing in importance owing to the successful westward march of civilization (made possible by faithful work and great self-denial on the part of our army), the second has greatly gained, and the main object of our regular army is now to be a national training school.

1. *The factor "time" in company training.*

In every department of human endeavor "time" plays a very important part and everywhere we note efforts to increase the amount of work and decrease the amount of time required to accomplish it.

In the subject under consideration the length of time is assumed to be three years and the work to be accomplished: the thorough training of the command.

Theoretical instruction, the gymnasium, the drill ground, the target range and the field exercises must each receive their proper share before the company can properly take its place in the battalion.

During the season of target practice we make the best use of the time at our disposal and consequently achieve great and often surprising results. The work is definitely prescribed—the time in which it must be accomplished is definitely limited and a failure to comply with prescribed regulations or noticeably poor results will bring about official inquiry.

A similar plan should be followed in regard to the entire train-

ing of the company. The work should be prescribed and time limits set in which it must be accomplished, leaving to the officer responsible for the efficiency of the command, the methods of instruction, the distribution of time and the order to be followed.

In the matter of range firing regard must of course be had to the interests of all organizations comprising a command.

The quality of the work at the expiration of the time allotted for its accomplishment should be decided by rigid and thorough inspections.

It has been the rule with us to have one hour's drill in the forenoon and another hour's drill in the afternoon. Allowing for the time required for the formation for company or battalion drill and the rests allowed during the drill, the time of actual work and exercise (and in many cases it does not deserve the name of exercise) is not more than one and one-half hours per day. This is scarcely sufficient to keep young, able-bodied men who are well fed and clothed, in ordinary good health, much less to make them efficient for field service and to train them to endure hardships and prolonged exertions without injury to their health. In winter time we often permit our men to lie in their barracks for months at a time. It should be our object to train them to work satisfactorily under all conditions of temperature and out-door work, in heat and cold, marching through snow and mud should not be looked upon as something dreadful and to be avoided even at the expense of preserving a healthy tone of the system and having the men at all times "in condition."

Of the six workdays in the week we practically utilize only five, Saturday of each week being taken up by prescribed weekly inspection of very doubtful value. In three years this would amount to a loss of about 150 days or five months of very valuable time. I will refer again to the subject of "inspections" further on.

The work should be so arranged as to employ the men from 5 to 6 hours daily for six days in each week.

2. *The Work in the Gymnasium.*

The company should be divided into a suitable number of sections or squads with capable non-commissioned officers or privates as instructors under the supervision of company officers. Ordinarily at least three hours per week should be devoted to this work and in winter time it should be had daily. By a frequent

change of apparatus by each section the interest of the men is retained and they do not easily become tired.

They should be instructed in walking, running (for speed and for time or endurance), climbing, jumping, (high jump and long jump) on parallel and horizontal bars, the vaulting horse, in wrestling and throwing iron staffs at targets (such targets to be of circular shape, about twelve inches in diameter, supported on a post of suitable height and having a spring attachment which forces the target into place after having been struck. A back stop of planks to be erected about six feet in rear of target).

The use of Indian clubs and dumb-bells to be voluntary, or if it appears desirable to give such instruction it should be confined to men proficient in the other exercises.

3. *The Work on the Drill Ground.*

A. Bayonet Exercise.—Proficiency of our men in the use of the bayonet is with us not the rule, but the exception, as shown in the reports of inspectors.

It might be asked why should the soldier learn the bayonet exercises when the fire of rifles is decisive?

In addition to being a means for the physical training of the men, proficiency in its use has a very material influence on the field of battle, both physical and moral.

The moral effect that is produced by the offensive on a large scale, is in small actions the result of a determination to attack with the bayonet. He who does not know how to use his bayonet will certainly not be determined to attack with it and thus he will never make a serious attack. In case of a bayonet attack the unskilled man will naturally use his rifle as a club and in consequence break it and expose himself to the chance of being unarmed as soon as he has disabled one enemy. If the man is more accustomed to strike than to point he will use his rifle as a club in the excitement of an action. Therefore it is necessary to make the soldier so accustomed to the bayonet by constant practice in pointing with that weapon that he will by force of habit use it in this manner. Each man should be able to use his bayonet with good effect and have confidence in his own skill. Bayonet drill might be added to the gymnastic exercises.

B. Drill in Close and Extended Order.—This drill, which may also be termed manœuvre and fighting drill respectively, is closely prescribed in our drill regulations.

The closer we approach in our peace practice the conditions

and requirements of war the more efficient our training will be. Nothing unnecessary should be taught, but that which is necessary should be taught well.

Our new drill regulations have not yet received a fair and thorough trial. They will, no doubt, be found to answer modern requirements far better than was at first supposed by many. It devolves principally upon the company officers to interpret them in the right spirit and to diffuse this spirit throughout the army.

Assuming that the company is well instructed and practiced in the drill regulations, the following suggestions seem to me worthy of notice, viz.:

1. The drill ground: there should be at all posts two drill grounds,—one level and with as few obstructions as possible for the close order drill and the teaching of the elementary principles of the extended order drill,—and the other on diversified, irregular ground with natural and artificial obstacles. The fact that ground for the latter purpose can be found only at some distance from the post should alone not be considered an insurmountable obstacle.

2. In the close order drill the very greatest precision down to the minutest details should be aimed at.

3. In the extended order drill a double object should be clearly kept in view, viz.: the training of the men and the educating and training of leaders of smaller bodies. To accomplish both objects thoroughly the exercises must be continued until by force of habit the men act as they are expected to do. Any tendency to looseness should be guarded against by the officers, for in no other work is concerted action and cohesion more an absolute condition of success.

4. Practice should be had in running for speed and endurance, carrying the rifle only and also with rifle and pack.

5. Marching long distances with full pack should be more frequently practiced.

6. For the drill in extended order the men should frequently carry the pack.

7. Leggins should be worn at all drills.

8. Company drills should never be less than two hours in duration.

9. Men should be practiced in jumping ditches, climbing improvised walls, parapets and other obstacles carrying rifles and packs, when they are fresh at the beginning of the drill and also

at the end of several hours constant work. The principal value of the practical gymnastic exercises is to give the men confidence in themselves. Even though infantry have learned to jump and climb in the gymnasium yet this will certainly not decide the victory since it is quite a different thing to jump ditches and climb walls after a forced march or a trying bivouac, with a pack on their shoulders. But the soldier who knows that he can overcome all obstacles advances with quite a different resolution to him who knows that he cannot.

10. There should be instruction and practice in night attacks.

11. Also in the use of the intrenching tool, the construction of temporary field fortifications and obstacles.

12. Practice marches of short duration should frequently be undertaken, the men carrying on their person what they would carry in actual warfare, not only till out of sight of the post but during the entire march. Such marches should be made occasions for practical instruction in camping, scouting, reconnaissance, advanced guard, outpost duties, etc.

13. Swimming should be taught wherever facilities offer.

C. Rifle Practice or Musketry Training. The course of rifle practice is intended to give the men such instruction in shooting as they require in order to make effective use of their fire-arms in battle.

Consequently this instruction forms one of the most important branches of duty, one that must be cultivated in all its details with the utmost care and encouraged in such a manner that the soldier, as early as the end of his first year of service shall be sufficiently trained to use his rifle in actual warfare.

The instruction during the remainder of his period of service should be directed to the perfecting and fixing of that which he has already learned.

Musketry instruction in our army is a thing of very recent date. Up to 1879 there was practically none. In 1883 began the publication by the Adjutant General's Department of the classification and order of merit of organizations and in that year we had 4834 marksmen. In 1884 we had 849 sharpshooters and 7081 marksmen. In 1885 the proficiency in skirmishing was made to form part of the figure of merit of the company. We had in that year 1510 sharpshooters and 9247 marksmen. In 1889 the conditions of qualification were made much more difficult, the rifleman not being judged by his best four scores but by the

aggregate figure of his last eight scores at the different ranges, to which was added the figure of merit he should obtain in his last four scores at the skirmishing targets. The number of sharpshooters and marksmen dropped from 1533 and 11,266 in 1888 to 679 and 3966 in 1889, which figures were raised again in 1891 to 922 and 4593, exclusive of the artillery which did not compete that year. These figures represent a constant improvement in instruction and results.

The course laid down for target practice must of course be rigidly followed, but we can ask ourselves, does our target practice accomplish its end, and if not, where is a change desirable and in what shall the change consist? What has been said in regard to the relation between peace training and actual requirements on the battle-field applies to musketry training especially. If we are training men for what we wish them to do in war it is necessary to have the training carried on under war conditions as nearly as possible. Without these conditions the records are of little value. It would be, and our firing to a great extent has been, nothing but mere record firing. Most of our practice seems for this and no other purpose.

Of course the practice on the range should—and if good results are desired must—be preceded by a proper amount of aiming and position drills, gallery practice and estimating distance drills. Our preparatory drills are all that is required and the following suggestions are offered in regard to the training on the range as at present carried out.

1. The target range: There should be

   a. A range for known distance firing and range skirmishing and

   b. ground favorable for the prosecution of field firing.

One range is not sufficient for the complete training of the men. What is essential in a range for one portion of the musketry training is absolutely hurtful for the other. The principal requirements for a known distance and skirmishing range being a comparatively level surface and absence of obstacles, and those for a range suitable for field firing, variety of features of ground and available cover and obstacles.

2. The course of practice should be:

   a. A course in known distance firing
   b. A course in skirmish firing
   c. A course in field firing

   } Similar to those at present conducted.

3. Classification of men.

The men should be divided into three classes.

a. Those not having had a complete course of instruction (recruits).

b. Those having had an entire course of instruction (men in second year of enlistment and not included in the following class).

c. Competent marksmen (good shots in second and third year of enlistment).

4. Suggestions in regard to known distance and skirmish firing.

a. Recruits should be required to compete the full course of instruction instead of only a portion as at present.

b. Men once qualified as marksmen should not have any more known distance firing in succeeding seasons.

c. Positions in firing which are impracticable on the battle-field should not be taught. The "back position" should be prohibited.

d. The men (with the exception of the best shots training for competitive firing) should be taught to use the "full sight" only for all firing, because:

aa. The men are more likely to use the same amount of front sight at all times.

bb. During excitement a full sight is more readily taken.

cc. In quick firing men are more likely to use a full sight, even if instructed to use a fine sight.

dd. A full sight can be used in all lights and at all ranges.

ee. Taking a full sight produces less strain on the eye than taking a fine sight.

e. The foot of the object to be fired at should be designated as the point to be aimed at in all firings, because:

aa. The line of sight inclines more and more to the ground as the enemy advances.

bb. The position of the shot groups is better and the zones grazed by the cone of trajectories is longer.

cc. Ricochets from lower half of cone are more effective.

dd. The liability to shoot too high is reduced.

ee. The objective is less hidden from view by front sight.

ff. Sight is more readily and quickly taken at the point or line where the object comes in contact with the ground than at any other point.

f. The men should be trained to fire at moving and disappearing targets.

g. All soldiers should receive instruction in rapid firing at known distances and in skirmish firing (also in field firing).

h. There should be less individual and more collective firing.

i. A portion of the practice should be held in unfavorable weather and at all hours of the day.

k. Skirmish and field firing should be made the chief feature of the course and the larger portion of the time and ammunition should be devoted to it.

l. Much more attention should be paid to volley firing.

5. Field Firing.

During this course the men should be trained to make proper use of the knowledge and skill previously acquired.

They should be practiced in the selection and use of cover—firing from behind natural and artificial cover—firing up and down inclined ground (such fire would almost invariably be required in the attack and defense of positions), etc.

During the exercises in field firing the men should frequently be fully equipped.

Whenever practicable this course should be combined with actual field exercises.

6. Company commanders should have entire control over the ammunition allotted to their companies. The ammunition to be used by such men and for such firing as may be ordered by the company commander.

7. Competitions and prizes.

a. There should be separate competitions for officers, non-commissioned officers and privates.

b. A prize of small value should be given yearly to the best two shots of each company and to the best four shots of each regiment among the privates. (The prizes not to be medals of any kind).

c. A prize of moderate value should be given yearly to the best five shots among the non-commissioned-officers of each regiment (no medals).

FIRE DISCIPLINE.

Fire discipline and trained subordinate leaders are recognized by all military writers as absolutely essential in all modern warfare.

Fire discipline includes the conscientious carrying out of orders during the musketry combat, and the rigid observance of the regulations regarding the handling of the rifle and conduct during the fight. It demands further calm endurance under the enemy's fire even when this cannot yet be replied to, carefulness in firing, and utilization of the ground so as to insure the most effective result possible, constant attention both to the leaders and to the enemy, and ceasing to fire the moment the object disappears, the leader's whistle sounds, or, in any other way the order to stop firing is given.

Fire discipline must be so ingrained in the men that it will continue to influence them even when in the course of the engagement, the direction of fire on the part of the leader can be but imperfectly exercised or ceases altogether, and when, at least, the behavior of the firing line can only be determined by the individual reflection of each man, or the example of exceptionally daring and observant men.

In order to develop and quicken the power of acting independently the men must be accustomed to situations of the fight in which the direction of fire ceases altogether and must be instructed as to their conduct in such circumstances.

It must be laid down, in general, for the conduct of the musketry combat, when the proper leading fails, that under four hundred yards all objects may be fired at, between four hundred and eight hundred yards only high and wide objects can be (not must be) fired at and that beyond eight hundred yards, as a rule, no more firing should take place.

D. SIGNAL DRILL.

The instruction of privates in military signalling with flag, torch or lantern and heliograph should be discontinued for the following reasons:

1. Satisfactory results are very seldom obtained, *i. e.*, the results obtained do not warrant the present expenditure of time and labor.

2. The men, as a rule, take very little interest in the work.

3. In changing details for instruction the men soon forget what they have learnt.

4. The practical value of this means of communication in the field is constantly decreasing.

5. Time taken up by this drill could be more profitably employed.

6. Better results would be obtained by confining the instruction to officers and non-commissioned officers.

E. INSPECTIONS.

As men are inspected so they will be drilled and trained. This subject is here considered in its bearing on the company only and not in regard to larger commands, though the same principles underlie all inspections.

Though the number of prescribed inspections in a command be very large, this is not an indication of efficiency, for while the form of the inspections may be gone through with, the spirit may be entirely wanting.

Inspections are of inestimable value and indispensable to secure efficiency of a command, if carried out in the right spirit. Numerous empty, formal ceremonies known by the name of "inspections" are worse than useless,—they are detrimental to the efficiency of the officers and men. The object of inspections is to ascertain the state of efficiency of a command. The number of prescribed inspections is with us far too great, resulting in a loss of valuable time, and still the object is, in my opinion, very poorly, if at all, accomplished.

The proper inspecting officers of the company as a unit, should be the company commander and the commanding officer of the battalion, the next larger unit of which the company forms a part, each one in his respective sphere.

Our army regulations under the head of "Stated Inspection" Par. 948 to Par. 955 prescribe among others a weekly inspection of the company by the company commander to be had every Saturday. This weekly inspection appears to me entirely unnecessary and superfluous. The company commander who sees his men daily, drills them daily, notices their arms and accoutrements daily, inspects the quarters daily, who in fact, is constantly inspecting his men assisted by his lieutenants and non-commissioned officers does not require to have a day set aside to inform himself of what he already knows. Should men be allowed to keep themselves and their belongings in an unclean state for six days in the week if they only appear *comme il faut* on the seventh for the space of half an hour? It would be better to ex-

ercise a constant supervision and abolish the weekly inspection as leading to no other result than a waste of time. The company commanders should be permitted to use their own discretion and judgment as to the number and time of personal inspections of their companies.

A monthly inspection by the post or regimental commander is also prescribed. What is the object of this inspection? Is it to inform the post or regimental commander of the state of efficiency of the command or simply to inform him whether the men keep themselves and their arms and equipments in presentable condition? If it is the former the inspection fails most signally to accomplish its object.

A yearly inspection by an officer of the Inspector General's Department is also prescribed. Does this inspection give correct information of the state of efficiency of the commands? Many such inspections amount to little more than those had by the post or regimental commanders at the end of each month.

Every inspection should have its definite object and purpose and should fully accomplish the same. The amount and quality of the work done by the company officers should then be brought to light and their own efficiency as well as that of their commands thoroughly tested.

The battalion commander should inspect recruits at the end of the recruit course and before they are drilled with the company. This inspection should be as thorough as possible and cover all the ground gone over in the course.

He should inspect the company at the end of the term assigned for company training. This inspection should be most complete and thorough, not neglecting the minutest details and testing the whole work of the company training.

Inspections of this nature cannot be made in the space of an hour or a day even, but will require several days to carry out in all their details. After this inspection the company is fit to take its place in the battalion and at the end of the course of battalion training the battalion should be inspected by the brigade or division commander. In the foregoing remarks it has been assumed that the term of enlistment for privates is three years and that the recruits for each year are received by the company at one time at about December 1st of each year.

Reprints and Translations.

MODERN INFANTRY TACTICS.

Translation from the Revue des Deux Mondes of April 15, 1895.

By Lieut. F. R. COUDERT, Jr., Squadron A, N.G.S.N.Y.

I.

IT was long thought that the French Revolution had created armies. In reply to the appeal of the country, legions had sprung up invincible in their enthusiasm and patriotism. This was but a legend, as history has shown.

There is still another legend which, born with that of the volunteers, has survived it. In the more limited and more special order of tactics people have thought, and still think, that the Revolution invented for its young armies a new system. They imagine that by a sudden intuition of genius it discovered battle formations unknown till then, and they repeat that this new method—without precedent in history—overthrew at the first shock the moss-grown edifice of the tactical system slowly elaborated through the centuries. This legend is as false as the other; in tactics the Revolution invented nothing. The ideas which it employed were current coin in the army before '89 and the forms under which it applied them were already known, and had been discussed and commented upon before.

It was an old quarrel, this discussion, as to the value of extended order and of deep order, or, to express it more accurately, between line order and perpendicular order. More than forty years had passed since the quarrel had begun. More than twenty had elapsed since it had divided military opinion. Up to the middle of the eighteenth century, indeed, line order had reigned supreme on fields of battle. It dated its existence from the day when the fire-arm became an efficient weapon and when the musket became the sole arm of the foot soldier. The whole history of tactics, from Gustavus Adolphus to Frederick II., may be summed up in a single line; "a more exclusive utilization of fire-arms; a more and more complete abandonment of the former tactical system which had for object shock, that is to say, the hand-to-hand conflict." Line order rested entirely upon the absolute predominance of infantry fire and it subordinated all the movements and all the methods of attack to the proper employment of the musket. Therefore the formation in deployed line (the men elbow to elbow in three ranks) was the basis of all manœuvres, the fundamental order of combat for attack as well as for defense. The column, fallen into disrepute, had disappeared from the drill regulations as well as from the field of battle.

But these tactical exaggerations to which the absolute preponderance of infantry fire had given rise, to the detriment of the old shock tactics, could not take root in France, without in the long run provoking protests. The close formations, the minute regulations, the strict and complicated drill with which it was necessary to surround the line order so as to render it possible in practice, resulted in causing the old Gallic spirit to revolt. It was felt confusedly that, imprisoned in the narrow and methodical formation, in the pedantic mechanism which transformed the man into an automaton, the Frenchman saw his best qualities annihilated, lost the advantage of his natural *élan* and of the quick impetuosity of his temperament. Instinctively the French infantry protested against all the restrictions which were imposed upon them in the name of principles which they did not understand, and ever and in spite of everything they sought for a method of coming back to the proud bayonet charge which so well suited the national character. In practice they unceasingly went back to it and it was the real secret of their force.

The first who dared to echo this heartfelt sentiment of the soldier was the Chevalier De Folard. He it was who first boldly and fearlessly affirmed the superiority of shock and the overruling necessity of coming back to tactical formations which rendered it possible.

The writings of Folard gave rise to warm discussion. He had touched a chord which responded to the secret aspirations of many and which gave form to opinions which did not dare to express themselves. The approval of Marshal Saxe gave strength to the utterances of Folard which were the beginning of that discussion which so divided military men during the second half of the eighteenth century. Shock tactics found favor quickly in our army and the system would easily have triumphed over line tactics if the latter had not suddenly received an unexpected consecration from the brilliant victories of Frederick II. Such was the glamour of these triumphs, all gained in line order, that it raised in Europe an irresistible current of admiration and assured to that system of tactics an ascendency which perpetuated it up to modern times. These victories did not succeed in converting to the Prussian tactics all those whom the writings of Folard had convinced. A strong and bold school remained which continued to affirm the superiority of the perpendicular order, which its chief Dumesnil-Durand proudly called the French system. In spite of the War Department, in spite of the efforts of renowned generals like Saint Germain or Guybert, this system continued to gain adepts among the subordinate officers of the army, and was fortunate enough to find an unexpected admirer in Marshal Broglie, and although he was not able for the moment to obtain for it official recognition, his public approval made that system live in the minds of military men and assured its future triumph.

Already in 1791 opinion was strong enough to force the editors of the new regulations to admit skirmishers and to authorize the formation of the battalion in close column for attack. This was still only a very small concession since the regulations of 1791 in their entirety were altogether founded on the principles of line order; in practice they gave no place to the theoretical concession made to the doctrine of shock, and the column

was only admitted to satisfy the general opinion; but from this moment that opinion was fixed, and deep order, officially condemned, nevertheless preserved all the favor of the army. Less than two years later, in 1793, there did not remain a single one of the editors of the regulations of 1791 at the head of the army. The Revolution had swept away the whole staff of the Royal forces and with it all the enthusiastic exponents of line order, all the faithful disciples of Frederick II. Thus the Revolution sharply and roughly terminated the quarrel which seemed interminable and turned the scale upon the side on which it had long inclined. There remained in the army only the subordinate officers and non-commissioned officers grown old in arms, all of whom had long since adopted the ideas of the shock tactics. In spite of the regulations of 1791, which no one thought of remodelling because it did not occur to any one to apply them, deep order was hereafter the only one in use. It is the system which assured the success of the armies of the Republic, it is from its application that Napoleon was able to gain his most brilliant victories.

"The quarrel which had divided during twenty years the partisans of Dumesnil-Durand and the admirers of the Prussian tactics was settled on the fields of Austerlitz and Jena and settled contrary to the principles of the regulations of 1791." Such was the conclusion to which General Renard had come thirty-five years ago when it first occurred to him to examine into the past history of the French tactics. Nothing has since arisen to negative his conclusion.

II.

The triumph of the French tactics was overwhelming. Marengo, Austerlitz, Jena and Friedland consecrated the system of perpendicular order. All the armies of Europe successively discovered its value and initiated the system, England alone excepted.

There is nothing more simple and more practical than this system of combat applicable to any kind of ground and to all situations. In front a thick screen of skirmishers; in the rear, safe from the bullets of the enemy and out of his sight, a series of small columns sufficiently light to be easily manœuvred in every direction. On the point where the attack is to be made these columns resolutely advance on the enemy to charge him; on the points where on the other hand the attack is to be repulsed the columns present to the enemy a line in good order which can fire at short range. The essence of French tactics was in this alternative working of columns and lines, always preceded, surrounded and followed by numerous skirmishers. But we must remember that this was the actual tactical system, the practical and constant usage of our armies since the early wars of the Revolution and during the wars of the Empire, but it was not the official written system. The latter curiously enough was founded on exactly opposite principles. The regulations of 1791 based, as I have explained, on the principles of line order, did not cease for a day to be the written law of the French army. Napoleon always refused to do away with this anomaly. Marmont intimates that Bonaparte, an artillery officer, General-in-chief at twenty-five, who had studied the manœuvres of infantry with an old sergeant of the French Guards, did not care to enter into a discussion upon

this subject with such expert tacticians as Davout, Ney, Morand and Gudin. I do not think this probable. It is more likely that he knew his generals and his troops were sufficiently familiar with the actual practice of war to be able to do without a written system, and that he preferred not to disclose to his adversaries the secret of his tactics. It is still more probable that he attached a secondary importance to the matters of execution constituting tactics. We are certainly induced to believe this when we remember his famous exclamation: "An army should change its tactics every ten years."

Is it possible, indeed, to suppose that an army can thus change its tactics at will as it changes the uniform of its troops and transforms its head-dress by turn from casque to kepi or shako? Are not tactics (that is to say, actual movements in battle) intimately allied to the weapons which the combatants use and to the conditions of the fight? What, then, is the significance of this exclamation of the great man which seems to shock the first principles of common sense? In 1810 all the European armies had copied the French tactical system. One after the other they successively abandoned line tactics in order to adopt, as we had done, the numerous and agile skirmishers and the formation of battle columns in deep order. This imitation was unquestionably the best proof of the superiority of our system. But at the same time it deprived the French army of one of the most important elements of its prodigious successes. Napoleon, who had devised and been present at the most splendid results of the new system of tactics upon the field of battle, and who had reaped the fruits of the overwhelming superiority of our armies, was troubled at no longer obtaining the same decisive results. He wished to astound the world anew and he began to dream of a new tactical system which would surprise the armies of Europe, his too faithful imitators, and which would have brought back the greatness and splendor of his early triumphs. This is why we hear him exclaim, "We must change our tactics every ten years."

Instead of dreaming of a new system, a dream the vanity of which he must have well known, Napoleon would unquestionably have done better to have clung to his own system, which was a good one, and to have prevented any changes taking place in it. In truth, in the course of the last wars of the Empire, under the pressure of circumstances, a double alteration took place. First a reaction set in against the use of skirmishers because of the lack of a written system of rules and regulations for manœuvring in skirmish line. The men once they had been sent in advance found themselves left to their own resources during the whole duration of the battle; they did as they pleased and acted according to their own initiative, escaping entirely from the control of their commander. Because of this a prejudice arose against throwing out a large force of skirmishers who were called by the too well deserved name of lost children (*enfants perdus*). This prejudice increased rapidly in proportion as our armies and troops became composed of younger and less sturdy soldiers. Besides, all the other armies of Europe having in their turn covered themselves with skirmishers, the rôle played by the latter seemed less important.

In the second place the battalion columns which had so easily overthrown the fine Prussian or Austrian lines now came in contact with other columns better prepared to sustain the shock, and we no longer find the swift glorious triumphs of the first days of the Empire. It was natural to try to find them again and logical to suppose that it could be done by increasing the force, that is to say the size of the columns. It is for this reason that toward the end of the Empire the columns began to be increased little by little, the light and easily manœuvred battalion column being supplanted by regimental or brigade columns and sometimes even by columns composed of entire divisions. We may thus sum up a double movement which took place during the last imperial wars in (1) decrease in the number of skirmishers; (2) increase in the strength of the columns.

III.

Napoleon gone, wars ceased. The army for a brief space dispersed. Upon its reorganization there were admitted to its ranks many officers who had not been formed in the school of our great wars. These officers still adhered in the matter of tactics to the regulations of 1791, which regulations were still, as I have explained, the theory and the written law of our armies. This it is which makes it possible to understand how these regulations in the long run obtained an entire ascendency.

Repeated protests of men who had had the largest experience in war and who had waged it with the greatest ability could not prevent the written tactics from gradually supplanting the practices which lived only by tradition. When therefore at different periods the regulations were revised it was only done for the purpose of making slight modifications in detail and not to change the fundamental principles. As was said by the Commission of Revision in 1831 "We have changed nothing of the plan or of the spirit of the tactical regulations of 1791." The Commission of Revision of 1862 in terms says: "The Commission has changed nothing of the plan or the classifications of the regulations of 1831." "The decree of 1862" (revising the regulations), wrote Trochu in 1867, "coming after the wars with the Crimea and of Italy and after the improvements in artillery and in the arms of infantry reproduces all the features of the system of 1831. The parade-like manœuvres still remain in infinite number with all their complications and with some other unexpected complications added." And he says again "Our generals and commanders to-day face the enemy with their heads full of formulas, that is to say, full of the eight hundred and forty-six articles of the regulations for evolutions in line which are for the most part impossible of execution in war." Morand had already written in his work called L'Armée Selon La Chart: "The manœuvres prescribed cannot be executed without great danger in the face of the enemy. In making use of them there will inevitably occur that which has already occurred on a hundred different occasions, the massacre of the battalions." Duchesne had also said in his essay on light infantry: "All the evolutions in line are simply splendid parades. Is it possible that our regulations, compiled before the Revolution and based on the manœuvres which Frederick II. executed in his camps, can apply to modern warfare?" And he repeatedly exclaimed

without contradiction, "what general, however good a tactician he may be, can say that he has drilled or manœuvred in battle a division or even a brigade according to the prescriptions of the regulations?"

All the officers who wrote subsequent to our great wars made the same statement and uttered the same complaint. Nothing was done, the regulations of 1791 remain unchanged. It is at this time that there arose in the minds of many officers the very singular opinions that the practice of war differed entirely from the theory and that the first thing to do in entering upon a campaign was to forget all that had been learned in times of peace; to do exactly the opposite of what had been done before; a strange and a disastrous conviction since it authorized laziness and justified all manner of ignorance.

It is exactly what happened in 1859. Certain it is that it was not to the strict application of the regulations that were due the successes of this campaign. The officers hastened to forget the written theory and came back in practice to the intelligent and healthy traditions of the First Empire. In this war again we find the employment of skirmishers and of line of columns, and it was by them that the work was done. The African wars had at least the merit of preserving in the army the spirit of initiative and of the offensive at all hazards. This was shown in the return to the elementary principles of deep order, that is to say, carrying on battle by small battalion columns preceded, flanked and accompanied by numerous skirmishers.

It would be supposed that this new proof of the absurdity of our official tactical regulations and of the contradictions between the superannuated theory and the practice which led to victory ought to have opened the eyes of all. Such was not the result. The war finished, everything went back to the old order and remained in *statu quo*. "In France," wrote General Renard, "military glory seems to have blinded tacticians. Military men say, we have vanquished all the nations of Europe with our present organization and we will continue to do so."

Thus after thirty years of war in Africa, after 1854, after 1859, after so many bloody experiences, the official regulations remained practically those of 1791 based upon the line order of Frederick II. Discredited and ruined in the opinion of all, they yet kept their place. Since the anomaly of such a situation seemed in no way to trouble the War Department, it was commonly said and commonly thought that nothing could be done in time of peace which would be of avail in time of war, and that it was really useless to prepare for war by study; that when the crisis came the sons would be able to take care of themselves as their fathers had so well known how to do, before them.

IV.

Prussia did not share in this opinion. Waterloo and 1815 did not satisfy her hereditary hatred. She passed her days in preparing for vengeance and worked unremittingly to that end. Almost immediately after 1807 the Prussians had not hesitated to admit that their defeats were primarily due to the defective tactical methods which they had employed. Consequently they unhesitatingly repudiated the traditions left them by their great king and abandoned completely the line order. They adopted and recommen-

ded the employment of skirmishers supported by columns, the extreme mobility and independence of the battalion, the abandonment of the system of lines and their subdivisions, and in place thereof charges in columns bound together by skirmishers.

We have here the fundamental principles of deep order, practiced by the French army during the first period of the Imperial wars, introduced and officially sanctioned in Prussia by the regulations of 1812. Thus (and this is not the greatest of the surprises which the history of tactics offers) while we obstinately retained the regulations of 1791 which perpetuated the influence of the school of Frederick II., the Prussians in 1812 officially abandoned their old regulations in order to substitute as the basis of their new tactical system our own actual methods of combat.

They, however, made some modifications in one important respect after the wars of liberation. After the disastrous campaign of 1807 they adopted a battalion of one thousand men strong, divided into four companies. Now, these large battalions made a very heavy column and one difficult to manœuvre, offering also a large target for the fire of the enemy. Thus, this battalion did not greatly resemble its model, the small French battalion, whose strength rarely exceeded four to five hundred men. To remedy this difficulty they substituted for the battalion column the company column with a strength of from two hundred to two hundred and fifty men. It must be remarked that in this respect the Prussians followed a course entirely opposed to that which we had taken toward the end of the Empire, as I have explained. While we were proceeding gradually to enlarge the column in the hope of thus augmenting the force of the shock, the Prussians on the other hand decreased its size in order to retain its activity and mobility. They employed a great number of these small columns and found them very satisfactory. This battalion formation, therefore, remained popular in the Prussian army. In 1825 its usage was so general that the regulations legalized it as an alternative system which might be employed, and in 1847 this system was officially made, not simply an accessory and useful formation, but the basis of all tactical movements and the fundamental order of battle.

It is certain that in the minds of the German theorists the substitution of the column of company for the column of battalion constituted only a slight modification of the battle formation of the Napoleonic tactics. Instead of manœuvring and fighting by battalions of five to six hundred men strong the Prussians thought it better to do so by companies of two hundred and fifty men; although the unit was smaller the methods were the same.

This innovation, questionable in itself, received very great importance by reason of the invention of the modern rifle. Shortly after having introduced this system in its official regulations Prussia was bold enough to adopt the needle-gun. The advantage of this weapon consisted entirely in the enormous increase in the rapidity of its fire; in all other respects it was mediocre and quite inferior to the rifles then used. For this reason it had been rejected by all European armies; but the Prussian generals considered that the rapidity of its fire would suffice to counterbalance its defects. The result proved the wisdom of their judgment.

Now, no tactical formation could be better fitted to this quality of the modern fire-arm, namely, rapidity of fire, than the company column. Its extreme mobility and the facility which it afforded for sending forward numerous skirmishers made it possible to use it to very marked advantage. It was thus a piece of rare good fortune for Prussia to adopt at the same time both the needle-gun and the tactical formation best adapted to the effective employment of that weapon. The use of the company column however, was attended by a danger which experience soon demonstrated and against which it was, at first, difficult to provide.

The battalion, indeed, once divided into four little company columns ceased to form a single unity under the complete direction and control of its commander. These four subdivisions became independent of each other and were forced to act separately. Thus the rôle of the battalion commander becoming limited to the general direction and coördination of the movements of the company, the captain became the real chief. There at once arose a danger lest this tendency should become too strong to be stopped in time; that the independence of the companies would result in the parcelling out of the forces, and separate uniform action give way to isolated successive action which would in turn result in disorganization, disorder and confusion. Again it was to be feared that in making a step in the direction of weakening of the instrument of shock, the battalion column, the tendency to make the fraction smaller would increase until the shock itself would be lost sight of and the possibility of preserving the formation corresponding to this mode of action absolutely lost.

Here was the danger and indeed it is precisely what happened. Its consequences however do not appear all at once. Two great wars were necessary to produce the logical development; and moreover the glorious triumphs of the German armies in these two wars concealed it for long from the eyes of the less experienced. The war of 1866 seemed indeed to pronounce against the battalion column, the bedrock of the Napoleonic tactics, in favor of the company column, a judgment from which there was no appeal. The two formations having actually met on the field of battle the result of the struggle did not seem to leave in doubt the question of the superiority of the company column as an instrument of combat. After the campaign of 1859 the Austrian army had tried to imitate the tactical methods of its conquerors. Austria's military man had been especially struck by the fortunate results obtained by the vigorous charges of our little battalions whose brilliant offensive movements, carried on and conducted somewhat contrary to the prescriptions of our regulations, had overthrown their strong and steady troops. Austria therefore made the bayonet charge by battalion closed in mass the foundation of its tactics and immediately began to instruct its troops to use this method on all occasions. But following our example also, she had herself fallen into the error of diminishing the importance of the rôle of skirmishers and of neglecting their employment. These were the methods employed by her in 1866. On many occasions throughout the whole campaign her infantry with the greatest bravery and with splendid tenacity made attacks in battalion column which were preceded or sustained by a very small and weak screen of skirmishers entirely

insufficient for seriously preparing by their fire for the charge. Everywhere these attacks failed wretchedly before the tactics of the Prussian army. The latter confident in their new weapon and tactical formations did not hesitate to hurl to the front its company columns. Independent and light, these columns easily moved over the field covered by a cloud of skirmishers who were able without much difficulty to approach the enemy's columns and with their rapid firing needle-guns to cover them with a hail of bullets. A fire of such unheard of violence cut short the onset of the Austrian battalions, suddenly paralyzed their attack and threw them into disorder and confusion. This was the moment awaited by the company commanders. At the head of the subdivisions which remained grouped under their control, they in their turn made a vigorous movement in advance, overthrew the remnants of the enemy's columns completing their dispersion and driving them by sheer force from their position.

It seemed then after Sadowa that not only the battalion column as a battle formation was a thing of the past, but also that it would be replaced by the company column for purposes of shock, and that in the future the skirmishers would have a preponderating rôle in battle.

These conclusions were accepted without qualification by the German army, who immediately proceeded to give this new method of combat its logical development. The German literature of the time abounds in treatises in which these ideas are developed and recommended with something akin to enthusiasm. A pamphlet, quite celebrated at the time and which was attributed to several of the highest officers of the army, summed up in the following terms the general impression. "The battle in skirmish line is the only formation for infantry, and the independence of the captains of companies the only method of properly applying the new system."

Thus the independence of the captain, the emancipation of the company became the incessant theme. The pamphlet above mentioned even went the length of attributing solely to the captains at the head of their independent companies the whole of the victories of 1866. "The whole success of the campaign of 1866," so concluded this treatise, "is due to the captains."

This is certainly a radical conclusion. The German tacticians no longer limited themselves to seeing in the employment of the company column a simple modification of the Napoleonic system, nor did they content themselves with basing this reform on the theory of making the battalion more mobile and less exposed to the fire of the enemy; they claimed that the four subdivisions into which the battalion was divided should be independent, and that their autonomy in battle should be assured and complete. They did not hesitate to consider the company instead of the battalion a tactical unit of battle, and to make the skirmish line the real line of combat. They even began to see in the strength of the fire of the skirmishers the real and only mode of infantry action. In thus lauding what seemed to them a real tactical evolution (that is to say, the battle by masses of skirmishers and independent companies), they took care to christen it with a new name and called it "extended order."

This was a first step in that tendency to exaggeration which I have noted before. Possibly, with their natural common sense, the Germans would

have, of their own motion, halted in this dangerous proclivity, for a certain reaction had already begun to manifest itself against the exclusive use of skirmishers and the parcelling out of forces in small independent groups, when the war of 1870 supervened. It was no longer the moment to correct and to modify its tactics; the German army applied them unhesitatingly, enlarging them and developing them to an altogether unreasonable degree, as I hope to show further on.

V.

Such a movement as we have seen in Germany could not pass wholly unperceived in France. Besides, the national vanity had suffered by reason of the swift and brilliant triumphs of the Prussians in 1866 compared to our hard won successes of 1859. People consoled themselves in attributing it to the superiority of the needle-gun, and sought to reassure themselves by praising the qualities of the chassepot. Nevertheless, confidence was shaken. It was felt in France that such a complete revolution in armament must inevitably lead to serious modifications in the battle tactics. It was felt, also, in a confused sort of a way, that certain new tactical methods had been made use of and that the Prussian victories were not solely due to the new rifle, but mainly to the manner in which it was used. These sentiments of curiosity and of apprehension quickly caused a feeling of such general dissatisfaction as to force the War Department out of the lethargy in which it had so long remained. A revision of the regulations was made in 1867; it was, however, a timid and awkward one, lacking principle and resulting in a hybrid imitation, a rough and imperfect copy of the German system, which the revisers did not thoroughly understand, and which they amalgamated more or less badly with our regulations. The new regulations, indeed, provided for a division of the battalion into subdivisions called columns of division, but no autonomy in manœuvre and no independence was given them; the battalion continued to move as an entity at the direct command and voice of its chief. Thus, indeed, the subdividing of the battalion was simply a complication and a new difficulty added to the old evolutions. Skirmishers also were mentioned, but always, as it were, with reluctance as a necessary evil, not as a rational method based upon a new conception of a theory of battle appropriate to the new weapon.

Imperfect as it was, however, the regulations of 1869 marked a step in the right direction and it is possible that the French infantry might have emerged from the unfortunate situation in which its carelessness and overconfidence had placed it and might have succeeded in disentangling itself once more if a most fatal error had not all of a sudden come to paralyze its most brilliant native qualities.

This error was that of a belief in the superiority of the defensive over the offensive. The enormous power of the modern rifle had given rise to this idea. The repulse suffered by the radical and unmethodical offensive system of the Austrians in 1866 contributed largely to the development of this belief. It was at this time that military men began to occupy themselves with a discussion of trenches and redoubts and an attempt to transform the slightest hill into an impregnable fortress. At the same time they recommended the use of long-distance firing and the exclusive utilization

of the long range of the rifle. It is hard to realize the discomfiture of the rank and file who had up to that time never dreamed of anything but attack and assault and whose imaginations had been fed by recitals of the bayonet charges of their predecessors. They thus found themselves hopelessly confused and the disorder thus engendered was one of the principal causes of the hesitation and lack of initiative of which the early battles of 1870 offer such a lamentable exhibition.

The triumph of the Germans in 1870 was not only one of generalship and strategy but was still more and principally a tactical triumph. It is to the overwhelming superiority of their battle methods that is due the wonderful uninterrupted succession of triumphs from Forbach to Hericourt.

In the face of their squads of skirmishers and multitude of little columns supporting them, our armies wavered, our lines hesitated, our commanders shocked by the very considerable losses which our superannuated formations occasioned, vacillating between the doctrine of the defensive and the old French traditions of the offensive at all hazards, hesitated and ended by remaining in disastrous inaction. Personal bravery did up to a certain point counterbalance tactical inferiority in the first engagements of the army at Metz; it was no longer the same however with the raw levies raised by the government of the national defense.

The German system of the attack made by single companies, small compact unities, well grouped under the hand of their commander and which transformed the battle into a succession of little separate engagements, succeeded admirably throughout the whole of the second period of the war. This mode of combat was exceptionally appropriate to the circumstances and easily triumphed over the ill-organized, undisciplined and badly armed masses which we had raised.

The campaign of 1870 resulted in Germany, still more than that of 1866, in the apotheosis of the company column, the captain, and the combat by squads of skirmishers. The movement which we have seen born in 1866 succeeded after 1870 in dominating military opinion completely. After Metz and Sedan, after le Mans and Hericourt it seemed altogether evident that the tactics which had made such triumphs possible must possess an overwhelming superiority. The most intelligent persons threw themselves without reserve into the current. Many years of peace and of reflection were necessary before any one dared to think and to say that the tactical methods followed by the German armies in 1870 presented serious dangers. This reaction has just resulted in the publication of new regulations which under the modest title of the regulations of 29th July, 1884, modified by ordinance of April 15, 1894, consecrated a new evolution in tactics whose history is curious in more than one respect.

VI.

With the war of 1870 the military edifice of France fell to pieces. But it was not only the constitution of the army and its organization which were condemned; everything which constituted what we may term the "Tactical baggage" of the old army seemed to be engulfed in the disaster. Theoretical principles and practical traditions, battle formations and drill regulations all seemed to be annihilated by the same blow.

It seemed evident that in order to keep pace with the astounding progress made in fire-arms that it was necessary to entirely remodel the methods of combat. Since the invention of fire-arms no such significant change has been produced as the introduction of the modern rifle. It was not therefore to be wondered at if it involved unexpected consequences out of all proportion to the slight modifications which had been produced in tactics for centuries before.

The French tacticians so long idle in their delusive security suddenly awakened from their torpor and enthusiastically advocated the new tendencies. To the eyes of these innovators it was not only a question of modernizing the old regulations and of repairing the worm-eaten edifice which was falling to pieces; it was necessary to undertake the work anew and to erect it upon entirely new foundations. In their opinion the cyclone of 1870 had not only swept away the old remnants of the tactics of Frederick II. and completed the ruin of the regulations of 1791 and of those based upon it; it had done more and had had a more serious consequence; the Napoleonic tactical system itself, the traditional French system, already somewhat shaken in 1866, was now discredited by the war of 1870.

The battalion columns had shown themselves to be too much exposed to the destructive effects of the fire. The number of skirmishers which it was customary to employ up to that time had been notoriously insufficient and their rôle had been in truth absurdly insignificant compared with that which the new methods required them to play. Although the needle-gun or chassepot were still imperfect weapons, sure to be improved in future, they had nevertheless carried the power of fire-arms to such a degree that already everything had melted before them and the moment was close at hand when fire must become the principal factor in battle. The brutality of this fact left no room for discussion; it was necessary without further hesitation to obliterate the past.

It was altogether natural that the young school which after 1870 had taken to itself the mission of reforming our tactics should first turn its attention toward Germany and attempt simply to imitate the battle methods to which she owed her victories.

Now, as I have already said, in the first moment of enthusiasm aroused by the campaign of 1870 the Germans had with one voice glorified combat by independent companies and lauded the overwhelming action of skirmishers. The latter were said to have engaged the battles which the captains won. They were no longer to be auxiliaries and accessories in battle; they were no longer to form a protective screen the fire of which prepared the attack of the columns in the rear. The modest rôle assigned to them by the Napoleonic tactics was no longer sufficient. On the contrary in the modern combat the line of skirmishers was to be the real line of battle. They alone should engage, pursue and terminate the combat, for the simple and conclusive reason that before the power of modern fire-arms they alone were prepared to appear on the field of attack and there maintain themselves and manœuvre. It seemed that under the fire of infantry neither columns nor deployed lines would in future be possible. These skirmishers must alone take upon themselves the functions heretofore attributed to

these formations. To the skirmishers must fall the principal rôle, to the troops in close order the accessory rôle, the modest function of support and reserve. It was the complete reverse of the old French method. In thus postulating the fundamental principle of extended order, namely, the omnipotence of the skirmish line, it is possible that the main consequence was overlooked. Before long, however, this consequence was forced upon the attention of all by a process of unanswerable logic.

In truth the strength of the skirmisher resides in the power of his weapon and to the perfection of the weapon which science has placed in his hands. If the battle is no longer to be aught but a fight between two skirmish lines it is to the enormous power of fire that this result will be due. The apotheosis of the skirmisher is the consecration of fire. No more lines, no more columns. Deep order and line order are together relegated to oblivion. The rifle alone if properly handled will suffice to decide the issues of the battle because it will be able to physically annihilate the enemy. Henceforth what is the use of exposing the soldiers to useless losses in obstinately charging the enemy instead of driving him from his position by rifle bullets? The charge will soon be nothing more than a legend and the bayonet an instrument to be deposited in the museums beside the coats of mail, the arquebuses and the flint locks.

Such indeed was the logical conclusion of the mania for extended order, for the exclusive employment of skirmishers, for the absolute abandonment of all formations in close order in the battle. The Germans, to be sure, took care not to go to such lengths. But it was not in our nature to stop half way and to hesitate to push to its extreme limits the logical consequences of our new theory. This was done by General Lewell in his well known "Etudes," when in summing up the incontestable postulates of modern tactics he said: "Fire has an immense advantage over shock; fire is thus the essential and shock the accessory. In France we have allowed ourselves to turn away from the real object, fire, in order to retain the shock because of a spirit of chivalry. In proportion as education increases throughout the army the error into which we have fallen will be better understood and the prejudices in favor of the shock will disappear."

Such was the conclusion to which military men arrived in France in 1875. Fire is everything, shock is nothing. The offensive is nothing more in reality than the bombardment of the position of the enemy. If well directed, the bombardment will render the position untenable and the adversary will evacuate it or will be annihilated. If it be necessary its effects will be completed by a short advance movement of the skirmishers sustained by reserves. The latter will charge an enemy already broken, but this final charge will simply be a consequence of the situation created by the fire. It will not be the object for which the attack was prepared and conducted, through the various phases of the struggle.

This irresistible movement in favor of the absolute and exclusive power of the rifle was not confined to France alone. Austria had adopted this opinion with the same enthusiasm with which after 1859 she had adopted the almost exclusive use of the bayonet. The Austrian regulations prescribe: "The bayonet charge, the most effective means of driving the enemy

from his position, can only be employed when the fire has so completely shattered him that no serious resistance can be anticipated. It would be fatal to make the bayonet charge the basis of an attack." These prescriptions were official and the Austrian army scrupulously followed them so that Lieut. Col. Von Kuhne was able to say after having followed the great manœuvres in Austria: "Do we Austrians then believe that the shock can be avoided? Do we seriously hope to replace it by a simple march forward, firing and attain the object by the sole power of fire?" At this period then tactics seemed to be nothing more than the art of moving lines of skirmishers and of skilfully directing and reinforcing their fire in order to give it a superiority over that of the enemy. Long and serious discussions were had as to whether it was better to march forward in line or in echelon or whether it was better to make rushes of one hundred, of fifty or of twenty metres. The drill regulations preoccupied themselves largely with the utilization of inequalities of ground, and the necessity of avoiding at any price the open flat country. The main object seemed to be to teach the soldier to hide with the same care with which he had formerly been instructed in all the armies of the world to stand up boldly and look the enemy in the face.

VII.

Such was the situation when in 1877 the Turko-Russian War broke out. The first impressions of this was deemed to be entirely favorable to the prevailing ideas as to the power of fire. But it was quickly perceived that the fire of the Turks which had repeatedly checked the brilliant attacks directed against Plevna had nothing in common with what was considered as skirmish fire. It was not an individual fire carefully aimed and made at a reasonable range, the rifle sighted to correspond to the distance. The Turks had contented themselves with opening fire at enormous distances, shooting point blank without aiming and without paying any attention to the adjustment of the sight, and by this rudimentary method had inundated the field of attack with an uninterrupted hail of bullets. It was by the employment of this system that they had succeeded in checking the vigorous onsets of the Russians.

Such an extraordinary tactical system could not fail to evoke the greatest astonishment in European armies. Nothing could be more opposed to the current ideas as to the effectiveness of skirmishers. The force of the latter was founded upon the rational and intelligent employment of practiced marksmen, who made use of the inequalities of the ground in order thus to use their weapons with greater ease and effect, and to keep up a well adjusted fire upon a given object. The Turks had done the exact opposite of this; they had fired a great deal and at all distances and with very little aim. If then fire was to preserve its preponderance on the field of battle and to continue its supremacy, it must be in a manner entirely unforeseen and very different from that recommended heretofore. It was at this time that there arose and flourished a new school who pretended to do nothing else than to renew the very basis of our tactics. It was necessary they said to utilize the precision of the weapon and its great range, just as up to that time its rapidity of fire had been utilized. The carefully adjusted and short

range fire of the skirmishers were to be abandoned and in its place volleys by subdivisions at the word of their commander substituted. In multiplying volleys and in properly juxtaposing them it would thus be possible to throw upon the whole field of attack (that is to say the ground which the enemy is obliged to cross in order to produce the shock), such a dense mass of bullets that it would be impossible for the attacking force to continue its march and to maintain its close order.

The tactical results of these new theories to which their inventors had given the name of "zone fire" may thus be summed up: the possibility of reaching by fire, and at the same time, both the skirmishers, the supports and the reserves of a force echeloned in battle formation; the creation of a danger zone in front of the line occupied sufficiently extensive to prevent the appearance of the enemy upon the ground upon which he could either open a skirmish fire or form for a charge.

From this only one step was necessary in order to arrive at the conclusion that it was a mistake to advance unprotected upon ground thus beaten by a hail of bullets, and that the assailant as soon as he had arrived within rifle range should halt and begin to fire, continuing his fire until he had forced his adversary to evacuate his position. That step the new school did not hesitate to take.

Thus the infantry fire became indeed omnipotent. It alone could give victory and its method was the volley fire at long range.

The individual firing executed by skirmishers aiming carefully and directly at a distinctly defined object was to be displaced by volleys fired by a group and methodically executed at the command of the chief. The individual fire is a fire at relatively short range upon an object which the marksman sees and aims at; the zone fire is no longer a carefully adjusted one and sometimes not even direct; the object is not to reach a given point but to cover with lead a surface of ground. In reality the officer aims all the rifles of his command; he calculates the number of weapons which must be put into action, the number of cartridges to be fired, the causes which may act upon the fire and the range at which to fire; the men are no longer anything else than the animated parts of a living mitrailleuse. Consequently there is to be no more offensive in the proper sense of the word, no continued movement in advance, no final assault, no shock—these are the souvenirs of a past epoch, superannuated and dangerous practices. Henceforth, why puzzle our heads to find new formations for attack? There are none, and could we discover some they would be useless. The essence of tactics is now to be found in the art of intelligent utilization, according to the dictates of science, of the ballistic qualities of the modern rifle and in this point of view offensive and defensive are equally useful since they both use an instrument of equal value. Up to that time the forward movement and the ardor with which it inspired the soldiers as well as the animation incident thereto had been found useful. Science has now changed all that. The attack is nothing more but a danger and ardor a fault.

VIII.

This then was the point at which the most advanced military theorists

in France had arrived in 1878. They were the men who flattered themselves that they personified the system of the future and that they outstripped the Germans in the march of progress.

And in fact they did far outstrip the Germans, The latter had never allowed themselves to go to such extremes. After some hesitations they had already energetically returned to the old method that of assault in force, the bayonet charge. The writings of Boguslawski, of Verdy du Vernois, of Kuhne and Von Scleff had never ceased urging the necessity of the final assualt; they claimed the more urgent necessity of preserving the proper character of the offensive movement which is the unceasing forward march and the real effective shock despite the power of the rifle, the volley fire, and the zone fire.

"Can it be supposed," says Col. Kuhne, "that it is possible to avoid the final shock and replace it by a march-forward-firing, attaining the object by the power of fire alone?" This is indeed the whole question, and it is a question which the Germans answered resolutely in the negative. It is not possible to expect that the fire, however powerful it may be, will ever suffice to dislodge an adversary. Sheltered, perhaps entrenched, in any case hidden in all the ditches, behind the walls or hedges, taking advantage of the slightest inequalities of ground, the enemy on the defensive will let the rain of bullets fall about him, and although he may suffer from it he will not retire. He will not leave a comparatively safe position even in order to flee, because to do so he would voluntarily expose himself without cover in the zone beaten by the bullets of the enemy. In order to force him to attempt a chance of safety so hazardous it is necessary to take from him all other hope; to meet him face to face and to drive him from his position.

It is not possible to concede (as does the Austrian drill regulations) that the bayonet charge should be a natural consequence of the situation created by the extreme intensity of the power of the fire, nor that it is fatal to base one's disposition for attack on the charge. Shock is and remains the only method of definitely breaking a strong and energetic adversary acting on the defensive, and of loosening the bonds of discipline which unite the soldiers of each organization, of dispersing them and of forcing them to evacuate by flight the position which shelters them. Shock then will remain the final object of the attack, the charge, which is the method of producing shock, will continue to determine the selection of the ground and the preliminary disposition, and the bayonet, its visible symbol, will remain the sacred weapon of the infantry.

Fire alone is not only powerless in attack but its action is also entirely too slow and long delayed. Long before the fire can have resulted in the material annihilation of the enemy or in obliging the remnants of his army to retreat and leave the shelter which their position offers them, the assailant who shall have marched resolutely against them, will have driven them out in a fair fight and forced them to flee. Once the critical moment has arrived when the enemy has been sufficiently demoralized to justify a vigorous forward movement to drive him out, every moment lost is detrimental. Such a delay at first causes useless losses and finally becomes a serious danger. All loss is a diminution of the chances of final success and

every delay opens the door to surprises, the arrival of reinforcements, and to a thousand other incidents which may change the battle and transform into disaster and defeat what a little energy displayed at the proper moment would have made an assured victory. How is it possible to expect to obtain by the power of fire alone a decisive result in the attack? The enemy has chosen his position and occupied it with a view to the more effective utilization of the power of his weapon, his men are intrenched, hidden or at least in some manner protected. They thus fire with a certain amount of coolness, are attentive to the orders of their commanders and have their supplies at hand and easily renewable. The assailant on the contrary has moved forward on to ground which is to him unknown, and he can only utililize the accidental and natural shelter afforded, and at the decisive moment he finds himself for the most part obliged to traverse an entirely open and exposed ground. He fires standing, or possibly kneeling, upon an enemy whom he can scarcely see but who has a good view of him, and he has at his disposal a very limited number of cartridges with little hope of receiving a fresh supply when most needed. Is it thus possible to compare the two situations? and is it reasonable to suppose that the fire of the assailant will ever succeed in overcoming and silencing that of the enemy on the defensive, unless there be a great superiority of numbers? The defensive position has naturally the incontestable advantage in the manner of firing.

If then the attack hopes to overcome the defense it is because it has on its side another advantage than that of the material efficiency of fire and this advantage is the onward movement.

It is this constant march forward that will attenuate losses by reason of the constant change of distance at which the enemy must regulate his fire; it keeps up the morale of the assailant and intimidates the enemy, disturbing more and more the regularity of his fire and thus causing him to lose the great advantage of his position. It is this forward march that will prove materially and physically to the enemy that his fire, however powerful it may seem to be, is really powerless to check the assailant. Man will never become a simple ballistic machine. He is a creature endowed with sentiments, instincts and reasoning, and we must remember above all things that it is upon his sentiments, instincts and reasoning that we must act and to attain this end a march forward is the surest method.

The attacking party must move and this movement must be sustained, and if possible continuous, interrupted only by the halts necessary in order to allow the men to catch breath and permit them to reply for a moment to the fire of the enemy and thus prepare to renew the forward march. In this way the assailant by successive, rapid and almost uninterrupted rushes will arrive within the decisive distance; and in one supreme effort, making use of the moral superiority which his advance will have given him, will bring about the final crisis which must rudely dislodge the enemy from his position and drive him out long before any amount of fire would have determined him voluntarily to have abandoned it. The forward move leads to the charge, the essence of shock. What difference does it make that the bayonet charge is rarely complete, that it seldom ends in a real hand-to-hand

combat? the enemy almost in every case giving way at the last moment. The charge must nevertheless remain the last phase of the attack. It is necessary in order to succeed, and it will itself only be successful when made with sufficient resolution, impetuosity and vigor to convince the enemy that flight is the sole method of safety. It is not a simple fusilade however violent it may be that will force this conviction upon the mind of the enemy.

In defensive action musketry fire is almost everything and its function is to shatter the mass of the assailant to the point of disintegration, to diminish his onset to the point of checking it and thus compromise the fundamental elements of shock tactics—mass and rapidity. In the attack on the other hand, fire, however indispensable, is merely an auxiliary. It throws disorder into the ranks of the defense and obliges them to scatter and divide their forces into numerous echelons; it disturbs its plans and battle formations and prevents it from carrying out or from properly making use of its combinations. In decimating the ranks, in killing the officers, in destroying those whose courage calls them to the front, demoralization and confusion is brought about and defeat prepared. But in order to complete the work, to gather the fruit of this confusion, to profit by the discouragement and the dismay, one other thing is necessary, viz.: the shock under whose violence the power of the organization of the enemy must quickly give way. It is then, contrary to the assertion of the Austrian regulations, precisely upon the charge that the plan of attack must be founded.

Dragomirof, the celebrated Russian tactician and fiery disciple of Souwarof, who unceasingly reviled those whom he called the chevaliers of the bullet and their pretenses of being able to do away with shock tactics by trusting entirely to the destructive qualities of the rifle, has summed up the discussion in one characteristic word: "Will it be possible for a soldier who has not the charge in his heart to approach the enemy within rifle range? He who does not know how or is unwilling to charge will not even fire." The charge, that is to say the violent onslaught with beating drums and flying colors, on the position attacked and the driving out of the enemy by sheer force is and will remain, what it has always been, the inevitable crowning of the work of the assailant and consequently the supreme law of aggression. Are not tactics, after all, precisely the research for formations which will permit infantry, despite the fire and the loss occasioned by it, to make use of the power of shock and after the bloody preparation enable it to reach the final act, the supreme effort, the bayonet charge?

Thus the discussion is now placed upon a true basis. To-day, just as one hundred years ago, what we must find are formations which will permit the infantry to pass over the zone beaten by the bullets of the enemy without losing the cohesion and material force which are necessary to the successful charge.

The employment of skirmishers selected in small numbers, coupled with the attack by small battalions massed in column, had solved the problem in the last century when placed in contact with the rigid lines and file fire of the system of Frederick II. The modern rifle, with its improvement, its long range, its precision, and above all the terrific rapidity of its fire, have necessitated a re-examination of the problem.

We must find some solution, and the army which will be able to discover it and apply it without hesitation, and make the necessary sacrifices, will find a receipt for successes which will be no less decisive and glorious than those won by our armies formerly by means of deep order.

IX.

The triumph of the school of the omnipotence of musketry fire and that of zone fire was of short duration and was never very complete. Fortunately there were always vigorous and intelligent men willing to protest against these weakening and demoralizing theories. "What is," cries Dragomirof, "the secret hope of these thin floating lines which stop to fire? They expect from a distance to be able to force the enemy to turn his back. Now, this hope is the exact negation of another thought, namely, the fixed resolution to meet the enemy man to man, which is the real method of obtaining the desired end."

In 1880 a reaction set in against these theories, and since then has constantly grown stronger. In 1884 it resulted in the adoption of new regulations.

We will have to examine somewhat closely the tactical methods ordained by these regulations of 1884. They mark a well defined epoch in the development of our tactics. However debatable may be the theories formulated and the formations prescribed, they have the advantage of being clear and precise and of presenting a very comprehensible image of battle such as was understood at that time by the distinguished men who presided over the revision of the regulations.

According to this theory (which we must remember was only yesterday our official code) an infantry attack is composed of three distinct phases. In the first it is necessary to bring the attacking party within effective range of the enemy, that is to say about five hundred metres; in the second it must push forward until it has come within assaulting distance, about two hundred metres; and finally in the third phase the assault must be delivered and the onslaught continued until the enemy has been dispersed by the shock. To these three phases correspond three distinct methods of action.

In the first method the forward march must be as rapid as possible, the assailant will take every care and precaution to avoid useless losses. To attain this object all means are available; the proper utilization of the inequalities of the ground and the shelter that it may afford, a formation in echelon or in open order or single rank, all are permissible. The characteristics of this first phase will be the open order and the moving over the ground by small groups whose size will permit them to conceal themselves from the adversary, and whose quickness of movement will render them less vulnerable to the fire.

These methods are entirely insufficient during the second phase. At that moment the assailant engaged upon ground, usually open and often flat; the fire of the enemy on the defensive acquires an efficiency which would be really overwhelming if the marksman should retain his coolness and did not already comence to trouble himself as to the issue of the fight. It is the movement in advance which has begun to disturb and demoralize

him and this movement must be maintained. It is not now so much a question of diminishing the intensity of the enemy's fire as of keeping up the march. Useless losses are to be avoided, but there must be no hesitation before necessary sacrifices.

But however great may be the energy animating soldiers, there is sure to come a moment when the emotion of constantly increasing danger and the instinct of preservation may carry them away, when the skirmishers, since it is they that form the line of battle, will stop and lie upon the ground and begin to shoot. As says Dragomirof "They do not stop to fire, but they fire because they stop."

Once they have stopped the enemy has attained its object. It has the assailant under its fire and feels that it has gained the mastery. In order to deprive him of this feeling it is necessary to take up the forward movement.

But how are we to raise these recumbent skirmishers? What force is able to again drive them from shelter in order to expose themselves to loss? From whence will come the *élan* which will give the impulse?

It is at this moment that the little groups of detachments echeloned around the line of skirmishers and designated under the general name of supports play their part. During the first phase in order to escape the effects of the fire they are scattered over considerable territory, but they have remained compact in the hand of their commander mindful to his voice and attentive to his example. As soon as the skirmishers have stopped, the supports come up one by one on the line and join the skirmishers.

Their arrival reinforces the line and increases the fire but that is not the main object of their advance. Their function is to carry the line forward and to give it the impulse which it has lost. They are in compact groups and their example speaks to the others, In order to follow them, for they do not stop when they arrive on the line, the skirmishers rise and all march resolutely forward until this new effort is in its turn exhausted and this renewed impulse lost and the line again stops. New groups must then enter the line in order to carry it forward anew by their impetus until the assaulting body has crossed the terrible zone of fire and has come near enough for the assault.

If the first phase of the action is that of a reasonable formation with large intervals, the detachments methodically assaulting; the second phase is that of a progressive closing up and of the successful entry in the line of compact detachments which remain in the rear.

Now comes the final assault. The line of skirmishers, carried on by the supports, has arrived within two hundred and fifty metres of the position of the enemy. It is necessary to penetrate it and to carry it with a large enough force to drive out the enemy. This will be the rôle of the reserve. There is here need of a greater and more energetic impulse. A detachment in close order is alone capable of producing this result.

The commander of the reserve must be careful to maintain it well in hand and to bring it, with every possible precaution and taking advantage of the variety of ground, to within as short a distance as possible of the

enemy. His time for action has come. The reserve all of a sudden arrives opposite the position which it must carry. It now advances with a firm and sure step in close order which shows clearly its calmness, its assurance, and its resolution to conquer. It no longer seeks to hide but moves forward openly with banners unfurled. Following its example the skirmishers rise, fix bayonets and rush to the assault, the final act of the drama.

Since the infantry combat was thus to be composed of three distinct phases it seemed logical to the authors of the regulations of 1854 to divide the units which must make the attack into three corresponding echelons. For this reason an attacking detachment was composed of a line of skirmishers, a line of supports and a reserve. Each one of these echelons has in battle its own well defined rôle; it formed a portion of the whole. If on the other hand we take into consideration the fact that the company will not have more than two hundred men to put in line, we can easily see that it will be unable to furnish the three echelons. Its numerical strength is too weak to make this partition which would be a division into atoms and not fragments.

The first tactical unit sufficiently strong to be subdivided into three echelons is a batalion (four or five hundred men). When the battalion is formed for battle the four companies will occupy different positions having each its own distinct rôle and defined method of action. They will thus be mutually dependent. The action of each echelon being closely allied to the echelon which precedes or follows, the company will not be able to change the nature of the combat or to advance it by one hour. The battalion is an orchestra with four musicians; each one does his part but the whole gives a single melody.

The battalion in battle has again assumed its true position, and easily manœuvred and properly divided, becomes what it has always been, a unit of battle.

We have been thus led very far from the first conclusions drawn from the war of 1870 namely, the apotheosis of the company, of the captain and of the skirmishers. We are far indeed from the time when it was proposed to find the solution of the tactical problem in the juxtaposition of small units fighting side by side with a common design but without any direct links nor subordination of the action of the one to the other in an independent rôle.

X.

Such was, during ten years from 1884 to 1894 the theoretical and official formula for infantry in battle. It was a return to the method of shock and a first reaction against the excessive importance given since 1870 to the omnipotence of fire and the preponderance of the skirmishers in battle. It was in fact a reaction against all the exaggerations of extended order. The battalion was reinstated as the tactical unit and its commander was again given a direct influence upon the conduct of the battle.

The object was good and the effort laudable but we must remember that the desired result had not been attained and that the method pursued to reach it could not in fact be successful, and this is the reason.

The battle formation which I have just described presents, it is true, an

ingeniously devised mechanism. There is the chain of skirmishers, the real line of combat, numerous supports following at short distance and in the rear a solid reserve ready to act. The total of these different echelons was called the normal order of battle. The action of this complicated mechanism is not very adroitly combined. The line of skirmishers advances within six hundred or seven hundred metres, the distance at which the fire is effective; then by successive rushes, determined by the arrival on the line of the supports in compact groups, it comes within about two hundred and fifty metres of the enemy. That is the distance for assault. The arrival of the reserve determines the final shock.

The picture thus presented is certainly very clear and the image of the combat is animated, but it is impossible not to feel that there is something factitious and conventional in this theory. To what does this division of the field of battle into three zones and the division of the action into three phases correspond? In reality the enemy on the defense in taking his position tries to have in his front an open plane. This plane covered by his fire is unattackable. Beyond, the cover and variety of ground may permit the assailant who knows how to utilize them to move forward and arrive at the edge of this open space. But the latter is of very variable extent. It may be limited to three hundred metres in certain places and in others may extend to eight hundred and one thousand metres, but on this point there is sure to be the greatest variance. It is an error to suppose the line of skirmishers to be straight and rigid, the men marching elbow to elbow. On the contrary it will be a crooked, sinuous line which will arrive at the base of the enemy's position, the point which the skirmishers will always be able to attain quite easily, but which they will be unable to pass without a violent effort. The chain will in places be concave and in others convex, and there will surely be many vacant places. It is an illusion to count as does the theory of the regulations upon the successful impulse which the supports will give to the skirmish line to carry it within assaulting distance of the enemy.

To fulfill this special function they are entirely powerless. Because, exposed to fire like the line itself, and tired of receiving blows without return, the supports will be lost in the line and will limit themselves to increasing its fire instead of waiting for the moment to rushing forward and carry the skirmish line through.

Is it certain or even probable that the arrival on the line of twenty-five or thirty men more or less grouped together will determine the skirmishers to leave the temporary shelter and to rush fifty metres in advance without apparent profit under the fire of the enemy? A sure instinct will tell the soldier that such a movement is as useless as it is dangerous. Admitting that the arrival upon the line of supports may carry onward the skirmishers, yet will not both skirmishers and supports soon halt exhausted by this effort? The new supports will have to be brought up, new efforts made, new losses incurred which will end in another halt.

Besides what is to be gained by a rush of fifty to one hundred metres over open ground in the face of fire? With the modern rifle, the fire of the attacking line will profit little by a gain of fifty yards and consequently

that is not the object intended to be gained in executing these successive rushes. The real object is to enable the reserve which is the body destined for the shock to come within assaulting distance under the protection of the skirmishers.

This distance the 1884 regulations fixed at two hundred and fifty metres, because it is supposed to be the limit which the infantryman can cover in double time without becoming winded. But even thus reduced I greatly doubt whether the distance can be covered. However, that is the real question.

Is it not a very narrow view to take of the charge to reduce it to a question of lung power? Although the assailant must be determined to come to a hand-to-hand conflict, nevertheless we must bear in mind that the assault rarely results in this. Its success is decided as soon as the enemy feels that he is powerless to withstand the assault and that he can only avoid the shock by retreating. From this point of view the question of the distance at which the charge begins is of little importance, fifty, one hundred or two hundred metres more can make no difference. What is really important is to make the attack so resolutely that it will shake the confidence and morale of the enemy, convincing him that the assailant neither fears his fire nor his bayonet. What must be produced is an energetic demonstration and a moral impression which will be due mainly to the attitude of the assailant and the resolution shown by him. It is not a question of a few metres more or less, and therefore it is not important to bring the skirmish line within this fixed distance of two hundred and fifty metres.

What will become of this system of battle tactics if the line of skirmishers has not the necessary rigidity and indispensable continuity for receiving the impetus which it is the function of the supports to give it? If these supports should be unable to fulfill their special role? If the reserve which is to perform the office of hammer in the final shock is unable to attain in compact formation this prescribed distance of two hundred and fifty metres?

XI.

The regulations of 1884 had thus placed the question on its true basis in attempting to come back to shock tactics despite the power of the modern fire-arm. Unfortunately they had adopted a false method in trying to obtain this result by means of the series of successive impulses produced by echelons, having each a clearly defined function.

This error was soon perceived, and the objections which we have outlined above as to the workings of this battle formation, its lack of flexibility, and the efficiency of the prescribed means to compass the end was soon seen by military men. So that after 1884 the problem was still unsolved, namely, by what means can the onward movement be maintained in order to result in the shock?

This is the problem to which the regulations of 1894 have given a new solution. How have they supplanted the function of the supports and by what are these replaced? Simply this; the new regulations do not replace them; they suppress them entirely.

The battle seems to have been looked upon by the makers of the new

tactics under a much simpler and more realistic aspect. The mists and absurdities which enveloped the former theory have been eliminated without hesitation.

Nothing can be simpler than the picture presented of the battle; nothing simpler than the means prescribed for surmounting the difficulties.

As soon as the action begins the battalion throws forward its skirmishers, not a few isolated men whose line is to be progressively reinforced during the fight, but a thick and seried screen. Their function is very simple. It consists in approaching the enemy as closely as possible and directing upon him a rapid and violent fire. In order to do this they move over the ground as best they may, taking advantage of the slightest inequalities or declivities, alternately walking and running, and thus they arrive in short time at the foot of the glacis of the enemy's position.

These skirmishers may indeed be followed by small supports, which, however, are in no wise intended to communicate to the line the successive impulses prescribed in the regulations of 1884. Their function is simply to repair the losses and fill the gaps which may be produced in the skirmish line. They have no other rôle, they are to follow the line as best they may and reinforce it at the opportune moment.

Behind this dense line of skirmishers and without any intermediate echelon will come the line of execution.

This second line will be composed of small columns, but compact, sufficiently strong for the shock. After all, let us remember that what is necessary is to make a breach in the enemy's line and then to enter it. To make such a breach is the business of the skirmishers, to enter it will be the business of the assaulting columns.

These columns will be small. They must be able to follow the skirmishers, escaping as much as possible the sight and fire of the enemy, moving with rapidity and taking advantage of the slightest shelter. They must moreover be completely under the hand of the commanding officer, obedient to his voice and example. They should be numerous in order to divide the attention and fire of the enemy, and acting upon his imagination, cause him to hesitate at the decisive moment. The company column is amply adapted to this work, having a strength of two hundred men at most, it is sufficiently heavy to produce the shock and is completely under the control of its commanding officer. There will not, however, often be found ground upon which this column can move without being seen and fired upon by the enemy. Therefore the line of company columns will follow the chain of skirmishers as near as possible. It is not practical to fix any distance and any indication in this respect would be chimerical, as the line of skirmishers does not present a full and regular alignment, so the company columns following it will be somewhat unequally scattered over the ground. There may be some points at which they can find shelter within fifty metres of the skirmishers, where, in order to avoid the bullets of the enemy, they will be obliged to remain two or three hundred metres at the rear.

This is now our battle system. Nothing can be simpler in theory and in practice. The skirmishers gain ground to the front as best they can, and

arrive at the foot of the glacis of the enemy's position and disorganize them by a well directed and rapid fire. This is the preparation for the shock. When this is sufficient the little columns move out from their places of shelter, and, advancing with a firm and rapid step, pass over the distance separating them from the skirmish line. Those nearest join the skirmishers and pass beyond them, carrying them forward in their onward movement; those furthest removed, taking a more rapid step, join the others, and finally, both together, columns and skirmishers, charge upon the enemy.

From the moment when the columns are thrown forward there must be no halt.

If it be dangerous to send out skirmishers and to move them forward to the foot of the enemy's position by successive rushes, to send out columns and then to halt them midway is fatal. From whatever distance the assault may have commenced it must be carried forward without interruption. The distance will, of course, vary depending entirely upon the position of the enemy and the nature of the ground. To stop after having once begun the advance is to do exactly what the enemy are trying to obtain, and gives him courage when it is necessary to discourage and demoralize him. Again, a halt at this point is sure to result in enormous useless losses since the onward movement is to be resumed again in a moment and besides there is the danger of being no longer able to resume the advance.

Once the glacis of the position is passed it will be carried by a single onset or the attack must fail. The assailant who has halted is unable to resume the assault without assistance. Reinforcements are necessary and a new action must be begun with fresh troops against an enemy encouraged by the sentiment of a first success.

XII.

The infantry combat thus appears in a very clear and simple form. There is no longer any normal battle formation, any complicated and ingeniously delicate mechanism, no numerous echelons advanced by rushes firing volleys with so many rounds or volleys adroitly thrown over the ground after the fashion of a watering-pot.

A line of skirmishers firing upon the enemy; small columns striking him. This is the last phase in the evolution of modern tactics.

This method is rudimentary and will probably shock many persons by reason of its simplicity. It is true that its application does not necessitate profound scientific knowledge so pleasing to those who wish to transform the battle into a calculation of probabilities and the soldier into a scientist capable of solving the equation. It will however find favor with those who believe that personal courage and self-sacrifice are still as they were formerly and will always remain the real factors of victory.

But are we not struck by the analogy of this method with that of the French tactics at the end of the Revolution? Is it not indeed a return to the tactical system of the first Napoleon? Thus it appears that we have moved in a circle, that we have returned to our point of departure.* This is also the opinion of Gen. Dragomirof. "Napoleonic tactics," he says, "rest upon an unalterable basis and upon principles which will never be changed by reasons of transformation in armament. It is that system alone

which has arrived at the perfect harmony between close and extended order, between columns and skirmishers, between the rifle and the bayonet." Is this after all wonderful? After the discovery of gunpowder the theory of the offensive was changed and with it the true form of attack: the column disappeared from the battle-fields and it was nearly three centuries before it reappeared. An analogous phenomenon, though on a smaller scale, was produced after the invention of the modern rapid firing rifle. The extreme development of this power caused the offensive action to fall into disfavor. For the moment it seemed to be hopelessly condemned. It now reappears under its true form which is that of the direct shock and reduces fire to its true rôle which is that of preparing for the shock; and thus we have a pure and simple return to the two formations which personify these two factors, namely, the skirmishers and the column.

MODERN WAR CONDITIONS.*

THE readers of this Journal are aware that we have never accepted the opinion so strenuously urged by some writers that what they term "The Great War of 189–" is an impending and inevitable calamity. We adhere to our "Plea for Peace," which has happily stood good for twenty-four years. But undoubtedly one of the securities of peace is the extremely formidable character of the armaments and means of destruction which would be employed in modern warfare; and it is curious that their practical effects should first be shown, not in Europe, but in the conflict between China and Japan, where Asiatic nations have been fighting with arms and implements imported from Europe. Without seeking to undervalue the importance of peace experiments, it is evident that they are of comparatively little use when endeavoring to forecast the effect of weapons and projectiles in the wars of the future. Still, by placing side by side the statistics of the near past in the field and those of the practice ground of the present, it is possible to obtain at all events some rough indications as to what will probably be the results of contests with improved means of destruction. The recollection, however, of previous anticipations, and their modification, or even falsification, in the field, naturally prescribes caution in prophesying, and confines those who try to look ahead to very general views. There exists a general belief that the greatly increased destructive effects of modern weapons will be so appalling that a complete revolution in the art of war will take place. Against this belief, however, there is much to be urged. In the first place, human nature is ever the same, and the extent to which it can be modified, strengthened, and, in a word, improved for military purposes is comparatively small. In the second place, both the opponents will possess practically equally efficient means of

* The title under which this article originally appeared was Projectiles and Explosives in War. From the *Edinburgh Review*. By permission of the Leonard Scott Publishing Co.

dealing forth death and wounds. In the third place, the figures of the range cannot be applied to the statistics of the battle-field without great deductions. For the above reasons, and also because experience shows us that in proportion as means of destruction become more deadly the measures taken to neutralize their effect increase in efficiency, we question whether the revolution in the practice of war will be so complete as some people imagine.

If the results of peace experiments were to be taken as identical with those to be obtained in war, the forecast of the battles and sieges of the future would be appalling indeed. Let us see what some of those results are. In a report dated August 19, 1892, of the board appointed by the United States Government to conduct experiments with magazine rifles, we find some most instructive and reliable facts.

"Fifty-three different rifles, including the service arms of the principal nations of the world, were tried, and all were subjected to most severe and practical tests. The particulars and results of these tests we shall not give in detail, for our object is to show only generally the destructive power of the weapons experimented with.

"The most important test was 'rapidity with accuracy.' The piece was fired from the shoulder at a target 6 feet by 2 feet at a distance of 100 feet, the cartridges being disposed at will or in packets upon a table. In (*a*) was ascertained the time of firing 20 shots and the number of hits produced. The magazine was loaded before beginning, and then held in reserve until the balance of 20 shots had been fired from the rifle, treated as a single loader. The result as to time was that the 20 shots were discharged in from 49 seconds Lee-Metford to 91 seconds Germany 1888; the Kropatschek 1886, Portugal, being left out of consideration as being altogether an unsatisfactory weapon. The hits ranged from 15 Murata Japan; to 16 Berthier 1891, France; Mannlicher Carbine 1890, Austria; and Mannlicher 1892, Roumania; and to 18 Mannlicher 1888 90; Krag-Jorgensen 1889, Denmark; Lee-Metford 1889, England; Germany 1888, and Mauser, Belgium 1889.

"In (*b*) 20 shots, rifle used as a single loader, chamber empty, time two minutes. The Lee-Metford fired 49 shots with 39 hits; the Mannlicher, Roumania, 41 shots with 38 hits; the Berthier, France, 38 shots with 26 hits; and the Krag Jorgensen, No. 5—the weapon ultimately adopted by the Board—38 shots with 35 hits.

"In (*c*) as a magazine gun, for two minutes, test begun with magazine empty. In the return it is stated—but it is no doubt a misprint—that the Krag Jorgensen, No. 5, fired 43 shots—it must have been 48 shots—with 48 hits; the Mannlicher, Roumania, 48 shots with 48 hits; while the Lee-Metford only accomplished 16 hits with 17 shots. The Mannlicher Austria 1889-90 fired 49 shots, but only made 45 hits."

From the above, it would seem that a body of infantry could on an average fire from twelve to twenty-four shots per minute, and if these shots were directed at a charging body which began its rush at a distance of 200 yards, scarcely one could miss during the forty seconds that the charge would last if made at speed. Let us now turn to the results of field-firing

in England. One of the most recent and practical of these experiments took place at the Home District rifle meeting, Bisley, on June 2, 1894. There were forty-five competing teams, each consisting of fourteen rank and file. The men were equipped as they would be in the field, with the exception that they carried no valises, no rations, and only sixteen rounds per man. Before commencing firing they were required to march eleven miles in less than three hours. On arriving at the ground they found the enemy represented by a target fifteen feet six inches long, by two feet high. There were eight irregular stages in the attack between 600 and 250 yards. At each stage two volleys were fired, the time allowed from the beginning of the attack to the final volley being fifteen minutes. The team furnished by the Scots Guards, and armed with the Lee-Metford, Mark 2, were the winners, making 127 hits out of a possible 224. The results of the firing of artillery against infantry are equally appalling. At Okehampton, in 1893, fifteen dummies were placed at each of six ranges so as to represent the advance of a firing line against a field battery at distances between 1700 and 800 yards. The number of rounds fired by the artillery was sixty-six, out of which twenty were common shell, the remaining forty-six being shrapnel. Seventy-four of the ninety dummies were hit. It must also be remembered that the actual advance of the infantry from 1700 to 800 yards would probably have been slower than it was assumed to be, and that at the close of the firing there still remained 800 yards to be traversed by the assailants, during which space they would have been exposed to at least six rounds of shrapnel and as many of case. A still more recent proof of the destructive power of modern field artillery was afforded by the performance at Shoeburyness on August 8, 1894, on the occasion of the annual volunteer competition. A target representing fifteen dummies was fired at, the ranges being unknown, by a sixteen-pounder rifle muzzle-loading gun. Four common shell with percussion fuse for finding the range, and four shrapnel shells with percussion fuses were fired. Each hit by shrapnel counted as two points. The winners were the 4th Detachment 3d Middlesex Artillery Volunteers, who in six minutes thirty-five seconds obtained twenty-six points—*i. e.*, thirteen hits.

Judging from the above samples of peace trials, it would appear that with modern arms opponents would be mutually annihilating. Enormous deductions have, however, to be made from peace statistics in order to even approximately forecast battle figures. One or both of the contending armies would enter into action after a fatiguing preliminary march in heavy order. The nerves and judgment of the combatants would be affected by exertion and the anticipation of danger before even a shot was fired. When the fighting began, each side, or, at all events, one side, would be under the disadvantage of not knowing the precise range. The aim would be disturbed by the constant rain of bullets and the crash of bursting shells. The delicate operation of fixing the time-fuses would be hindered by shaking hands and beating hearts. In short, the difference between firing at an enemy who does not reply and one who does, between firing at a silent foe and at one who is firing at you, would be very sensibly felt. It is difficult to obtain reliable battle statistics, but it would appear that as regards the

effect of infantry fire in recent wars, the percentage of shots to hits—not necessarily disabling hits—is from ¼ to ½ per cent.

This means that, accepting the higher computation, it would take 200 shots to hit one man. In old days—*i. e.*, in those of the smooth-bore musket, it required, so it was said, a man's weight in lead to kill him. He can now be slain at a less expenditure of ammunition, but still there is an enormous number of shots whose only result is noise, for increased range and accuracy have to contend with freer use of artificial and natural shelter and tactical formations adapted to the present state of things. That, however, firing so deadly on peace ranges should become comparatively so innocuous on the battle-field is a fact which is almost incredible to those who have not been in action. Those who have taken part in severe contests can relate how often bodies of men have been exposed to a constant fire for some time, the air being apparently alive with whistling bullets and shrieking fragments of shell, with a small proportion of casualties as the result. Fervent admirers of, and believers in, modern arms, especially ardent artillery officers, will hold forth glibly about annihilation, but they forget that if weapons have become more destructive, human nature, as we have remarked before remains practically the same, and cannot be improved—for fighting purposes—beyond certain narrow limits. Discipline and training may do much, but will only restrain, not abolish, the tendency of the soldier to fire rapidly without taking aim, which tendency is increased by the speed and ease with which rifles can now be fired and by the large amount of ammunition at the soldier's disposal. Mere ardor and excitement will cause him to fire rapidly, but, in addition, when under stress of danger, he often seeks to encourage himself by making a noise and firing back at the enemy as fast as he can, with the idea that his bullets, even if they hit no one, will shake his opponents' nerves. While on the subject of human nature, we would point out that a certain percentage of loss will now, as ever, demoralize troops, while a substantial addition to that percentage will produce panic and induce retreat, if not flight, among all but the very best and most war-hardened troops. Whether, therefore, the losses are spread over a long time or take place in a few minutes, the moment at length arrives when self-respect, courage, and discipline give way to the natural instinct of self-preservation. At the same time it is certain that a percentage of casualties—say 40 per cent. in a single battalion—occurring in the space of five minutes will be more demoralizing than 50 per cent. spread over a period of one hour. Similarly if in an army corps the casualties only amount to 10 per cent., while in a single brigade of that army it reaches the total of 40 per cent., the larger loss in that brigade will produce a greater effect on the whole than if the general percentage of the army corps were doubled. Soldiers are in such matters very sympathetic. Though all statistics lead one to believe that the percentage of killed and wounded in an army will rather diminish than increase in the battles of the future, still there is no doubt that certain battalions, brigades, divisions, and army corps will in some cases be almost annihilated. Such occurrences have been known in the battles of the smooth-bore days, for, naturally, the shorter the distance which separates two bodies, the greater the loss among those who give way.

The difference, however, in this respect between the wars of the far past and those of the immediate future will consist in the concentration, as regards losses, both in time and space. Under some circumstances—especially when fugitives cannot spread out and get under cover—entire battalions will be wiped out of existence in a few minutes. Such events, however, will not be frequent, on account of that unchangeable factor—human nature.

While on the one hand, owing to long ranges, concentration of fire on a small front will be possible, on the other hand, from the same cause, added to the increased flatness of the trajectory, destruction will be greatly distributed in depth. The danger to generals, to the doctors, and to litter-bearers will therefore be enormously increased. As to second lines and reserves, they will, unless greatly favored by the ground, be more or less exposed to fire from the very beginning of an action. Long range, increased accuracy, and greater destructive effect of guns and rifles, will render it most difficult to accomplish a close reconnoissance of an enemy's position. The above causes will likewise to a slight extent increase the distance to which outposts and advance guards are pushed to the front, for the object of both is to enable the main body to assume battle formation before they come under effective fire.

The effect of smokeless powder in war has yet to be ascertained. It will probably not be so very great as it was first believed that it would be. Hitherto the outline of the position has been delineated by the smoke of the rifles of the defenders. Now, the discharge of rifles is only accompanied by a faint mist not visible at one hundred yards. Artillery, however, betrays its presence and, in a general way, position by an electric-light sort of flash, and by the dust which the downward blow of the powder gas raises from the ground when the latter is not moist or covered by thick turf. It will be possible in future to conceal, to a certain extent, the position of the defenders' firing line, even though it be in action, by placing it behind hedges, along the border of a wood, or even in shelter trenches provided that in the latter case no freshly excavated earth be exposed. Hence, in order to ascertain how a position is occupied, it will be necessary to make a reconnoissance in force, which cannot fail to be a very costly operation, for the defenders, if concealed, will not betray their presence by smoke, yet their fire will be none the less deadly.

The operations of the cavalry in advance of the army will also, owing to smokeless powder, be much hampered. Imagine a brigade advancing rapidly in a country studded by woods, hedges, and villages. A few picked infantry shots concealed in the above allow the scouts and their supports to pass without notice. On the arrival of the main body shots are fired from every side, no smoke showing whence they come, and the reports, owing to the echoes, being only misleading. It is conceivable that an entire brigade might be brought to a stand or compelled to retreat with loss by no more than one hundred infantrymen. As between the assault and defense of a position, clearly the advantage will be on the side of the defense, for the defenders will often be able to keep up a heavy fire without being seen, while the assailants will show themselves in order to advance, and will be under steadily aimed fire until quite close to the enemy.

Owing to the increased efficiency of guns and rifles, it will on the one hand be necessary for the defenders of a position to protect themselves by cover from the deadly fire of their opponents, while on the other any visible parapets will be far more easily destroyed than formerly. It will, therefore, be desirable whenever possible to make use of natural cover, as not likely to attract the attention of the enemy, such as ridges, boundary banks, etc. These, however, are not always to be found, and recourse therefore must be had sometimes to artificial means. Anything, however, in the shape of ordinary field works, unless masked, must be avoided, for they would be conspicuous targets, would draw the enemy's fire, and would soon be destroyed. Even such unobtrusive defenses as shelter trenches are worse than useless, for experiments have shown that they afford infantry scarcely any protection against shrapnel. How, then, are infantry and artillery to be protected? The answer is, by artificial cover which is invisible at a few hundreds of yards' distance. In the case of the infantry, a simple narrow trench without parapet, the excavated earth being carried off and spread about, so that the position should not be marked, would serve the purpose. In the case of the artillery—pending the application of the Moncrieff disappearing system to field guns—each gun should be placed in a gun-pit, the muzzle just clearing the ground, and the earth being removed as in the case of infantry shelter trenches. In short, the assailant must be given no clearly defined target. The objection to the removal of the excavated earth is that the process would take much time, involve much labor. Allowing, however, that both time and labor were trebled, compensation would be obtained by the increased efficiency of shelter trenches thus constructed. Should, however, it be found impossible or too arduous a task to remove the excavated earth, it may with advantage be formed into a low, flat, and thick parapet covered with grass or leaves. The state of the case is as follows. Cover from sight and fire is more needed than ever, but such cover must not be conspicuously visible; indeed, it should not be visible at all at distances greater than one thousand yards.

The artillery insist, as we have pointed out above, that their arm will be a preponderating factor in the next European war. It certainly has made immense progress in almost all respects, and especially in range.

Notwithstanding, however, the enormous distances which a modern field gun can now carry, this power cannot practically be turned to useful account, under ordinary circumstances, in the field. Lieutenant-Colonel Wilkinson Shaw, in the latest edition of his "Elements of Modern Tactics," says that the extreme useful range of artillery is 3000 yards, because of the limits of vision. Major Sisson Pratt, in his work on field artillery, points out that the actual effect of shrapnel, which is the man-killing projectile of artillery, is dependent on three things: (*a*) the striking velocity of the bullets on the bursting of the shell; (*b*) the height at burst above the plane; (*c*) the distance short of the object aimed at when the shell bursts. The remaining velocity of the bullets should not be less than 500 feet per second in order to disable a man, and this condition being borne in mind, it may be taken that, as far as remaining velocity goes, we can fire shrapnel at distances as great as 5000 or 6000 yards; (*b*) and (*c*) are regulated by the

cone of dispersion, and at great ranges the angle of descent is so great that ricochet is almost prevented. He considers, therefore, that the extreme limit for shrapnel is 5000 yards. He adds, however, that owing to the difficulty of observing the effects of a shot 3000 yards should be regarded as the extreme useful distance. In short, putting other considerations on one side, the limit of range is not that fixed by the power of the gun, but that of the power of vision. Here the gunner falls to the rear and the optician steps to the front. Considering the difficulty of transporting the large amount of ammunition needed in modern war, no artillery officer would care to fire without being able to ascertain whether his missiles produced any effect. Under favorable conditions the presence of a large body of troops can be detected at vast distances by the flashing of the metal in their arms and accoutrements, and by the dust that they make. An error, however, of 100 yards in range—and that is a slight percentage of miscalculation in a distance of 5000 yards—would make all the difference between a useful and a wasted shot. At 5000 yards it would be almost impossible to ascertain the point at which a common shell with a percussion fuse struck the ground. Even with the favorable circumstances of a good light and background, the presence of some clearly defined objects in the landscape, and with the aid of a good glass, the range could not be accurately determined at three miles, which is equal to 5280 yards. It may be considered, therefore, that a shrapnel fired at a moving column of troops at anything over 5000 yards would be a pure waste of ammunition, while at between 4000 and 5000 yards any effect would practically only be produced by chance. At stationary bodies, such as a battery exposed on the crest of a position or a village known to be occupied by the foe, firing up to 5000 yards might be allowed. Even then, however, the effect produced would probably scarcely excuse the expenditure of ammunition.

It may be urged that, considering the powers of glasses, such strict limits of distance are out of place. But what are the powers of glasses? The Gregory-Mackay field glass of three diameters—*i. e.*, making an object looked at through the glass appear three times as large as it appears to unaided vision—is perhaps the best field glass in existence. What, however, could be distingushed with the naked eye at a distance of three miles? It is a question whether the smoke of a common shell exploding would be visible at all at that distance. It certainly would be difficult to ascertain, even with a field glass, whether the explosion had taken place at 100 or at 200 yards short or over. A telescope of 30 diameters would, of course, be ten times more powerful than the field glass above mentioned. but even with such a telescope it would not be easy to estimate distance with anything approaching to accuracy. Moreover, from the facts that shrapnel shells have little destructive effect at any distance much over 3000 yards, and that a common shell does comparatively little injury to troops in line, there would seem to be no object in firing at such a long range. It may be added, too, that the troops fired at would have time to minimize danger from the shell by lying down or slipping behind a bank or swell of the ground before they suffered much,

Indeed there is no reason why troops occupying a village or a battery in

readiness for action should not be withdrawn, placed under the nearest cover, or moved to a flank as soon as shells begin to fall near them.

With regard to field-works it is different. These cannot be moved, they offer a large mark, and they probably would soon be destroyed by shells filled with high explosives, such as melinite, as used in France. These shells fired from howitzers or field mortars would not only wreck everything above ground, but, falling from a considerable height with a great angle, would break through any covered shelter likely to be met with in a field-work. Hence we consider that field-works of any command will for the future be inadmissible. For them will have to be substituted enclosures surrounded by a trench devoid of parapet. The men occupying such trenches would not, of course, be absolutely safe from fire, and a shell falling in them would work great havoc. This havoc, however, would only extend to the space between two traverses cut out of the solid ground, and battles cannot be fought without some loss. As to the earth excavated it might either be carried away or employed in the construction of a deceiving, false or dummy work in front, in rear, or on one flank of the work really occupied. One consequence of carrying away the excavated earth would be an increase of labor and time in construction. This fact would probably induce generals to have recourse but sparingly to field-works in battle, and to substitute for them, as far as possible, natural cover. As to shields for protecting the artillerymen when working their guns, the employment of which have been urged by not a few writers, we are totally opposed to the idea. They would add much to the difficulties of transport, already almost overwhelming. They would serve to make a battery more conspicuous. Finally, a single shell would utterly destroy a shield.

The magazine rifle and the machine gun seem to add enormously to the destructive powers of armies, and no doubt they possess a certain value. That value, however, is less than might be imagined by civilians. Both have the disadvantage of using up an enormous amount of ammunition, and the magazine rifle also encourages men to indulge in that hasty, unaimed fire to which all but the very best troops are so prone. The power of pouring in a rapid succession of shots when infantry are charged either by infantry or cavalry is of great advantage doubtless, but that power should not be exercised till the assailants are close at hand and no shot can miss. The machine gun is also valuable as an adjunct to cavalry. In the event of cavalry charging cavalry, the time available for the firing of the horse artillery battery is very short, and undoubtedly one machine gun pumping lead at the rate of 600 shots per minute would kill or disable in that minute more than one horse artillery gun could put out of action in the same time. A machine gun could also, under favorable circumstances, be conveyed under cover to a concealed spot, whence it could, by an enfilading or oblique fire, kill all the gunners of a battery before they could ascertain whence the death hail was proceding. This performance would be, of course, greatly facilitated by the use of smokeless powder. It must, however, be borne in mind that the specially favorable conditions under which alone such an exploit could be achieved would rarely occur. Only by stealth could a machine gun do any injury to artillery, and a single shell bursting near the

machine gun would dash it to pieces, or at the best thoroughly disable it. The use, therefore, of this apparently appalling engine of war is strictly limited by circumstances. The best method of employing it would seem to be when used by infantry to keep it concealed till the last moment, and only bring it into action when the firing line is thickening for the final rush. As to machine guns accompanying cavalry they would probably be screened by a squadron till the moment of the charge, when they would be unmasked, or would take ground to a flank in order to open on the opponents.

As regards battles in the open the chief changes brought about by the improvements in weapons would probably be as follows. The flatness of the trajectory of modern rifles, and their range extending to two miles, would compel artillery to keep at a greater distance from infantry than formerly—say at one of 1500 yards at the least. Guns and gunners constitute six conspicuous groups in each battery, and the limbers and wagons, with their horses, likewise are good targets, for it is not always easy to place them under cover. It is true that infantry firing at guns which bestowed on them an occasional shell would have their nerves somewhat shaken, but if closely supervised, and able to rest their rifles on a log or bank, one hundred tolerably steady and fairly good shots ought to be able to play great havoc with a battery in the open. Should there be no natural means of providing support for the rifle, a recent invention by Mr. W. S. Simpson, will make them independent of nature. This invention, which is under the consideration of several foreign governments, is cheap and simple. It consists of a steel rifle rest nine inches long, and weighing two ounces. It is fastened by a ball and socket arrangement to the stock. When not in use it lies flush with the stock, to which it is fastened by a spring clip. Thus history repeats itself, and the old arquebuss is adapted to modern requirements.

As to the effect of increased efficiency in duels between artillery, they will not be very great, for practically the guns of opposing armies will be equally effective. Of course a superiority in number of guns will, as heretofore, tell, and favorable ground and skilful tactics will be important factors. It seems to be generally admitted that the battery which, having got the range, fires the first effective shell or two will, skill and courage of gunners being equal, gain the victory. Hence the necessity of accurate, simple, and easily manipulated measuring instruments, whatever they may be called, followed by rapid ranging, succeeded, as soon as the range has been determined, by a quick adjustment of fuse. All the efforts of artillerymen, therefore, should be devoted to perfecting instruments, the obtaining of ranges rapidly by common shell, and simplifying and accelerating the adjustment of the fuse. The artillery on the defensive will obviously possess a superiority over the artillery on the offensive, for it will, before the action begins, have had, in the case of a prepared position, time to ascertain almost to a yard the exact distance to every probable artillery position within range. On the appearance, therefore, of a hostile battery, the defenders will only have to realize the position of their opponents before they open fire, thus gaining all the time consumed by the assailants in ranging.

As to the action of infantry against infantry, it seems to us that, assum-

ing a total numeral equality on both sides, the defensive has gained much by recent inventions. In a *bataille rangée*, though the absence of smoke from rifles will prevent at first an exact ascertainment of the line of defense, still the defenders' batteries will soon roughly indicate it. But there is no reason why the bulk of the defenders' infantry should not be kept withdrawn and concealed till just before the moment of collision in the assault. Their position would have been determined on and marked in a manner visible to themselves, but invisible to the enemy, while the distances of various objects on the line of the enemy's advance would have been ascertained. Either the defenders would, at the moment of the assault, line a natural bank or ridge, or would be crouching concealed in narrow shelter trenches without parapets. At all events, and under any circumstances, they would know the ranges better than the enemy, and would present much smaller objects to be fired at, for the assailants must stand up more or less to advance. Moreover, with nerves and muscles shaking from first marching from their previous night's quarters, and afterwards advancing rapidly in attack formation, they are not in such good case as the defenders for accurate shooting. Hence it seems to us that, if the ground be fairly favorable, the frontal attack of a deliberately taken up position occupied by resolute troops is almost certain to fail. We may, however, remind our readers that a strongly fortified posittion, such as we have seen in the past, will no longer be of any avail, so deadly is the power of modern shrapnel and common shells filled with a high explosive.

In the British service we have no field howitzers or mortars, but in some foreign countries both form part of the field army. Russia already possesses three field mortar regiments of four batteries of six mortars each. It is stated that on October 1 two new regiments, each at first containing only two batteries, were to be added. Shells fired from either field howitzers or field mortars would quickly work havoc in villages, but as soon as the defenders saw that vertical or high-angle fire was becoming effective, they would naturally move out to a flank or the rear, ready to reoccupy their former post as soon as the artillery fire had ceased and hostile infantry were advancing. Villages and conspicuous field-works are simply shell traps, and to be avoided, save when only infantry fire is brought to bear on them.

Among students of the art of war, including, of course, those practical soldiers who do not work merely by rule of thumb, there are two rival schools. One favors the defensive, and of these Lord Wolseley is perhaps the most prominent; while among those who maintain that the offensive is superior are to be found the majority of German officers, and, among English officers, Captain F. Maude, late R.E., whose opinions deservedly carry great weight.

In a campaign a battle is fought (*a*) by two armies coming into collision when both are on the march; (*b*) when one army deliberately takes up a position, and is attacked by another army. There are two kinds of defensive—the passive and the defensive-offensive. It is generally conceded that the passive-defensive is objectionable on the ground that it only produces, at the best, negative results. Such is not, however, strictly speaking, quite accurate in all cases. For example, A occupies a position; B attacks A,

and recoils with heavy losses, and much demoralized. If B has failed, before losses and demoralization have weakened him, to carry the position, he is not likely to succeed at the second attempt, when numerically weaker and morally discouraged. Unless, therefore, B has hopes of receiving soon large reinforcements, he probably retires. It may be said that B, having failed in a direct attack, will seek to turn A out of his position by manœuvring, but if that course had been open to him, he would, it is reasonable to suppose, have adopted it in preference at first. Consequently A, having maintained himself in the purely passive defense, has achieved a modified but distinct success.

Frequently the passive-defensive is imposed upon a commander by circumstances. He may have been ordered, with a force inferior to that of the enemy, to maintain himself at a certain important strategic position until he can be joined by large reinforcements from the rear, or until the commander-in-chief of the main army shall have completed some strategical scheme. It is conceivable that he is just able, and no more, to hold his own, and that the enemy, in his unsuccessful assault, is nevertheless not so shattered as to render it prudent to attack him. The defender may also be deficient in guns of large calibre, or in cavalry, a deficiency from which the commander of the defending force would suffer were he to advance out of his carefully selected and prepared position. It is, therefore, evident that there is no absolute rule about combining the offensive with the defensive, and that circumstances must dictate to a commander whether he shall assume the passive defensive, the defensive-offensive, or the purely offensive. Those, therefore, who so loudly extol the active-offensive fail to see that the attitude of a commander must depend upon circumstances which the greatest ability cannot always control.

The offensive has always possessed certain advantages, which, by improvement in weapons and the development of certain accessories, have been increased. The advantages of the defensive are the following: The defenders, subject to strategical considerations and the direction of the enemy's advance, can choose and strengthen a strong position. If they cannot, for reasons which we have enumerated previously, construct field-works and shelter trenches, they can, at all events, destroy cover for the enemy in his advance, and keep the assailants stationary under close fire by wire entanglements, pickets, inundations, and other obstacles not easily destroyed by the attacker's distant artillery fire. The defender can ascertain the ranges from all parts of the position to spots likely to be occupied or advanced over by the enemy, and especially to all probable artillery positions. Finally, the defender can, from the nature of things, make better arrangements for the supply of ammunition.

On the other hand, the defenders are stationary, and it is always demoralizing to troops to remain immovable under a heavy fire. This disadvantage would, however, be neutralized to a certain extent by keeping the defenders for the most part either concealed or drawn back to the rear under cover of a ridge or swell of the ground until the decisive moment of the attack approached. Besides, the infantry might, as we have pointed out previously, owing to the introduction of smokeless powder, be able under

certain conditions to keep up a heavy fire without being seen by their opponents. Finally, if occupying a good position, the defenders' infantry would at the decisive moment of the assault find an antidote to the unpleasant feeling of being shot at while stationary, by recognizing that they, the defenders, were suffering less heavily than their antagonists. Firing is as inspiriting as moving when the firing is plainly effective. It is true that the assailants would leave their killed and wounded comrades, and consequently would not be disheartened by the sights of their wounds. That however, only applies in its full extent to the firing line, for each successive line would pass over a greater number of dead, dying, and wounded men. The principal advantage of the offensive is that the assailant knows where he is going to hit, while the defender does not know where he is going to be hit. The former, therefore, obliges the latter to conform to his plan, and he is not always able to do so in time to meet the blow. Hence doubt, uncertainty, and a certain amount of marching and countermarching among the occupants of a position. The attackers can suddenly mass a large number of guns opposite a particular section of the defender's position, thus crushing the defender's artillery before it can be reinforced. Against that it may be urged that the defenders ought to be able to ascertain by instruments the distance to all the probable artillery positions of the enemy, and take the opportunity of correcting the distances ascertained by instruments by actual ranging with common shells at reconnoitring parties, or the range-finders or markers of the foe. It is argued that the defenders cannot tell what artillery positions will be occupied by the enemy, that the latter will probably send forward their own range-finder to stealthily take by instruments the ranges, and that after all the exact ranges can only be found by firing, for instruments cannot be relied on. The answer of the supporters of the defensive is that an experienced and judicious artillery general will have carefully examined the ground over which the enemy must advance, and that he will—putting himself in his opponent's place—have ascertained what artillery positions exist; and it must be remembered that there are rarely many suitable for a large number of guns. These positions having been noted, the defender's artillery officers would keep their glasses turned on them, and would observe the first appearance of the enemy's range-finders, artillery reconnoitring parties, and markers, and would be prepared accordingly. Indeed, if the defensive position is taken up while the enemy is still at a distance, there is no reason why the distances from every point in the line to every probable artillery position of the assailants should not be ascertained by actual ranging with common shell. Assuming, however, that actual ranging should for any reason be impracticable, and that all that can be done is to ascertain by map and instruments the various distances, the defenders would still have the advantage for reasons which we will proceed to adduce. Before giving these reasons, however, we may be permitted to say a few words of explanation to those who are not well acquainted with artillery action. It might be assumed that, the exact distance from a gun to its object having been ascertained, the only thing to be done would be to train the gun on that object, to give the correct elevation, and to set the time-fuse. In practice, how-

ever, such is not the case. Artillery officers say that the best range-finder is the gun itself, for that, owing to the uncertain strength of the powder, which often deteriorates from keeping and varies in its effect according to the weather, owing also to the greater or less density of the atmosphere, and the force and direction of the wind, experiment alone will give the exact practical range. How important it is to obtain this range quickly can be easily imagined, for obviously if two batteries are opposed to each other the one which burst six shells among its opponents before it receives one has already gained half the victory. How difficult it is to obtain the range quickly all artillery officers know. Prince Kraft zu Hohenlohe Ingelfingen is very emphatic on that point. He says that in peace it is comparatively easy to find the range, yet he adds: "I was once present when in time of peace one of the most practised instructors of the school of gunnery continued for this reason"—a depression just in front of the object—"to shoot 500 yards short of the target."

At Sédan Prince Kraft, with two batteries of corps artillery firing at the enemy distant 2700 yards, was more than an hour before his guns began to hit. If this was the case at a distance of only 2700 yards, what is likely to happen at greater distances? Now Prince Kraft says that the artillery should, as a rule, open at over 3800 yards, that under some circumstances guns may fire at as much as 5000 yards, and that the decisive artillery duel should be fought at from 2200 to 2700 yards. From the above it will be seen how difficult it is to ascertain the distance quickly by ranging.

To return, then, to the case of the defenders' *versus* the attackers' artillery. The former have at all events ascertained by instruments and looking at the map the real distances to the probable artillery positions of the enemy. Suddenly the enemy's guns appear, and unlimbering—a process which occupies an appreciable amount of time—proceed to fire common shell in order to get the practical range. The defenders' artillery commander, as soon as he sees the teams begin to turn, orders shells to be fired at the elevation corresponding with the instrument range. These shells fall before, at all events, those of the enemy, and are more likely to be accurate than those fired in return: for the assailants, strange to the ground, and working in a hurry and under excitement, are probably not very exact. At all events, the defenders are at least one shot ahead of their opponents. It is urged that the assailants could bring, say, 100 guns to bear upon sixty of the defenders'; but assuming that the number of guns is nearly equal on both sides, we fail to see why such should be the case, for the defenders would have, or ought to have, all their guns in position, and owing to the great range of modern artillery the guns of the sections adjoining that section attacked by a long line of the enemy's batteries could coöperate in the defense.

Captain Maude makes a strong point of the fact that the obligatory position of the defenders' infantry renders it easy for the assailants to destroy them by shrapnel fire. He argues that, assuming guns to be placed on the summit of a rise, the firing line of the infantry must be placed some 600 yards down the exposed slope, in order to prevent the assailants' skirmishers from creeping up and picking off the gunners. He fixes 600 yards

as the distance in front of the guns as required both to protect the firing line from the premature bursts of the shells of their own artillery, and also to keep the enemy's skirmishers at a respectful distance. The supports he would place 600 yards in rear of the guns in order that they may not be exposed to the "overs" of the enemy. He then goes on to imply rather than to assert that the defenders' guns having been silenced and compelled to retire, the firing line must either fall back or be reinforced by the supports. In either case 600 yards would have to be traversed under the full fire of the assailants' shrapnel.

Captain Gall says: "Unless the ground is flat or when firing up-hill, guns should not be posted in the same alignment as the infantry firing line in defense."

He then quotes the Artillery Drill Book, which lays it down that the guns should be about 500 yards behind it, "the infantry firing line in short re-entrants, from whence they can flank the salients, or on the crests of hills with the infantry entrenched a short distance down the slopes."

Prince Kraft also dwells on the necessity of pushing forward infantry some 500 yards in front of artillery in order to keep the enemy's skirmishers at a distance. There is no doubt that a few infantry creeping up to within, say, 1000 yards of artillery engaged with the enemy's guns could harass the gunners greatly.

Means, therefore, must be found of keeping them at a distance, but it does not necessarily follow that the defenders' infantry should for this purpose be pushed down the hill. The sharpshooters in question would probably be few in number; a handfull, therefore, of the defenders' infantry distributed in the intervals of batteries would suffice, for they would know the range, which their adversaries would not. A stronger body might be placed on the flanks of the guns, whence, even in the case of a line of eight batteries, they could bring an effective oblique fire to bear on the enemy's riflemen. Again, small enclosures or depressions in advance might be occupied with the same purpose. Under no circumstances, however, should there be more than a very thin skirmishing line pushed down the slope, and this should not be reinforced. The defenders' guns being withdrawn or silenced, his infantry should from the rear march up to the crest of the position, the skirmishers falling back on them. Supposing that the guns were only partially silenced, and that yet the assailants' infantry advanced to the storm, the thin skirmishing line should run back by twos and threes through the intervals between batteries. As to what Captain Maude says about the supports being placed 600 yards in rear of the guns, it is quite possible that the fall of the ground may permit of their being placed with safety much nearer. At all events the entire line of the position would not be occupied by artillery. We maintain, therefore, that his endeavor to magnify the offensive at the expense of the defensive has failed. Of course, the offensive-defensive is the best plan of battle, and under any circumstances a portion of an attacking force almost invariably remains on the defensive, at all events for a time. It is, to us who will generally be inferior in numbers to our opponent, encouraging to realize that modern inventions favor the defensive; for not only shall we in most cases be the weaker army, but

the national characteristics are such that British soldiers, while daring and impetuous in delivering an assault, are especially resolute in receiving one. This is Lord Wolseley's opinion, and he has not only read much military history but greatly practised war.

There is an invention, not yet fully developed, which is likely to play an important part in war, and that is the balloon. We dismiss the idea of the balloon employed to carry powerful projectiles and to drop them over an army, a fort, or a town; for, in the first place, we have not secured a navigable balloon which can select its own course; and, in the second place, such shells could just as accurately, and more easily, be fired from a mortar or howitzer. The captive balloon is a realized invention, and could render great service by ascertaining the position of the enemy's second line and reserves, and by notifying the approach behind a rise of the enemy's artillery. Also, wide turning movements could be discerned and announced by it.

Another invention—*i. e.*, the quick-firing field gun—threatens to be largely adopted on the Continent. The advantage of this gun is that, as there is scarcely any recoil, the men will be saved much of the enormous fatigue of running up and relaying guns after each shot. This fatigue becomes excessive when, for the sake of getting the protection of a crest, the trail of the gun is down-hill. Before quitting the subject of artillery, we would observe that fixed ammunition in cases not only facilitates loading, but also tends to preserve the powder from deterioration. Attention cannot be too strongly directed by our authorities, not only to this point but to the protecting powder from deterioration.

Another point which will increase the power of all arms is the question of vision. The experience of those who have made ocean voyages is that sailors can, owing to constant practice, not only discover ships which are invisible to landsmen until the whereabouts is pointed out, but even describe them. There is no doubt that the power of perceiving troops at a distance can be largely increased by practice. On the other hand, in order to baffle long vision it is probable that most armies will, in time, reduce the amount of glittering metal as much as possible.

As to modification in the formation of infantry, the consideration of this important subject would require more space than we can here afford. We may, however, be permitted to say that everything points in the direction of a partial reverting to our old battle tactics. For the assaulting infantry to halt from time to time in order to fire will be proved, we think, in future to be a faulty proceeding. Troops acting in that manner would be at a terrible disadvantage as compared with the defenders' infantry, as we have shown previously, and the great object is to remain exposed to fire as short a time as possible. Hence they will not incur delay by halting periodically to fire at small objects at uncertain ranges, but hasten steadily, but quickly, on till at, say, 200 yards' distance, they halt, discharge all the shots in the magazines, and then charge. To get them to advance without firing, it will be necessary to subject them, in time of peace, to the strictest discipline, the most rigid drill, and on the battle-field to move them when attacking in single rank, with only such small intervals as will serve to give them free-

dom of motion. This formation will be found to produce little more loss than the present rushes interrupted by halts to fire, will give them the encouragement afforded by the contact of comrades, and will enable the commanders to retain their hold of their men. The fire action in the attack must devolve on the artillery and on infantry on the flanks, told off for that purpose only, and not intended to take part in the actual assault.

Cavalry will not be greatly affected on the field of battle by modern changes. It is true that the magazine rifle will enable infantry to pour, within a minute, a large number of bullets into a mass of charging horsemen, and the absence of smoke will deprive the cavalry of a screen which heretofore has frequently enabled them to approach infantry and artillery unseen. At the same time there will frequently be, as hitherto, mist, folds of the ground, copses, etc., which will enable cavalry to steal up close to their opponents before they are discovered. Another fact should be borne in mind, viz., that the intensity of battle will be much increased, and that the attention of men actually engaged will be more than ever absorbed by the contest with the foe in their immediate front. This absorption of mind will frequently enable cavalry to draw quite close to the flank of a firing line without attracting attention. When rifles were first adopted there was in England almost a consensus of opinion that the day of cavalry on the field of battle had come to an end. On the introduction of breech-loaders that verdict was emphasized. The Germans, however, never held that view, and a reaction has during the last ten years set in, even in this country. In theory cavalry have only to appear on the battle-field to be wiped out of existence. In practice it is found that under certain conditions cavalry in large bodies, and still more frequently in small bodies, will be able to act with effect against infantry taken by surprise or previously shaken. Against resolute infantry not taken by surprise, cavalry have at no time during the last century and a half been able to effect much, and now any attempt would be hopeless. Against the deadly effect of infantry fire, however, must be set the extraordinary moral effect of a cavalry charge. How great that moral effect is may be ascertained even at peace manœuvres.

The effect of modern improvements in the appliances of war on the power of permanent fortifications to make a prolonged resistance will, we believe, be considerable. During the last forty years the old method, based on the system of Cormontaigne, and what was called the "Modern system," has been gradually abandoned, and is now completely replaced by the system of detached forts. The leading features of these are simplicity of construction, an almost entire absence of flanking fire, save for hindering the passage of the ditch, a large supply of traverses for the localization of the effects of shells, and an ample provision of overhead cover and bomb-proof shelter. The parapets also have of late been strengthened by iron plates and revolving iron turrets of the Grüsson and similar types. Against direct fire these last would, no doubt, do well, but must in the end succumb to a persistent rain of heavy projectiles. Also it is conceivable that good overhead cover could be provided, but a garrison, however completely under cover, is in a position of the most passive resistance if infantry cannot

be brought out to resist an assault. Let us imagine a chain of forts, well provided with head-cover for both guns and the infantry lining the parapets, as well as complete protection for the reliefs and reserves. Unless the ground were specially favorable to the besiegers—and we may assume that the planners of the works would take care that such was not the case—regular parallels and approaches after the old fashion would not be attempted. The reason is obvious. No men could live while constructing, or, rather, attempting to construct, the first parallel at anything like a moderate distance—say 500 yards. The distance of every spot would be known to a yard by the garrison, and the incessant rain of bullets from rifles and machine-guns would soon kill all the workmen. Even the adoption of a cuirass such as Herr Döwe's, or some other, would only slightly reduce the slaughter. The cover of darkness would be of slight protection on account of the electric light. On the other hand, it would be possible for the besiegers to take up an enveloping position at, say, 3000 yards, the guns being placed under existing or artificial cover, and fired by indirect laying. The distances of the guns from the particular fort selected for attack might vary so as to baffle the besiegers, and still further to accomplish that object, as well as to minimize loss, the guns might be placed at wide intervals. In these intervals the infantry might be drawn up, masked as far as possible either by existing hedges, banks, or folds in the ground, or by bushes placed in as natural a way as possible. Considering also the distance, small bodies of infantry might here and there be posted at much closer ranges, the main line firing over their heads. The guns, if the ground under their muzzles were kept moist, would stir up no dust, and the only indication of their position would be the flash, but that would be an uncertain indication for return fire. A fort which, roughly speaking, was 300 yards long by 100 yards deep, would offer a large target which could not be missed, and the effect of the constant fire of the attacking artillery on the interior space can be imagined. Assume that the guns of three army corps—say 360 guns—reinforced by a light siege train comprising howitzers and mortars, fired at the rate of two shells a second, and 30,000 infantry, allowing for reliefs, fired 400 rifle shots per second, plus a score of machine guns to give occasional intensity, and the result can be realized.

Of course the duel between besiegers and besieged would not be quite one-sided. In the one case, however, there would be one plainly visible, compact, large target. In the other, there would be an infinite number of small targets, some invisible, others scarcely visible, and the range of which it would be difficult to get. Every bullet and shell from the besiegers would be almost certain to do some damage, whereas the missiles of the garrison passing over a gun or a section of infantry would, in all likelihood, prove innocuous. Of course the adjoining forts would be able in theory to assist in the defense, but being further off than the fort singled out for attack, would do little mischief. Besides troops would be, no doubt, told off to keep the adjacent forts in check. Supplementary works and shelter trenches would be used as supports by the garrison, but they, being field works, would soon be disposed of. It is no rash assumption, therefore, that after serving for twelve hours as a focus for between three and four hundred

guns, 30,000 rifles, plus, perhaps, a score or two of machine guns, the best modern fort would become untenable. Almost all the armies of the world are supplied with high explosives, to be used with shells, and some sad accidents have shown us that the gases of those explosives, which have, like gun-cotton, nitrous compounds for a base, are most poisonous. Not long ago in Germany an officer and six engineer soldiers rushed forward to ascertain what the effect of an exploded mine had been. As soon as they reached the crater they fell dead at once. They were promptly dragged out, but it was found that they were corpses. In "The Great War of 189–," in the relation of a supposed attack by the Germans on the forts round Rheims, occurs the following suggestive passage:

"At daybreak on the 12th we moved forward to the attack of the intermediate positions—not against the forts themselves, for these were mud heaps, so saturated with the carbonic oxide due to the explosion of our gun-cotton shells that they were equally untenable by friend or foe."

Again, relating to the capture of a portion of the chain of forts round Paris, occurs the following passage:

"At daybreak this morning, after preliminary bombardment of twenty-four hours, the position between the forts of Vanjours and Chelles was stormed. The effect of the bombardment was just what it had been before Rheims, and we left the forts untouched. The garrisons had taken shelter in the bomb proofs, and at first refused to come out; but seeing themselves completely surrounded, and as the deadly fumes of our bursting shells began to penetrate into their retreat, they at last came out and laid down their arms, seeing the impossibility of further resistance."

It is conceivable that covered corridors, lining the outer parapet, might be rendered proof not only against splinters, but against the impact of a large shell fired from a mortar or howitzer, followed by the explosion. The work would cost money, but money is not much taken into consideration when forts are concerned. It is also conceivable that similar cover might be provided for reliefs and supports. There must, as to the corridor, however, be openings to the front to fire through, and in the roof or rear wall for ventilation. Through the first set of openings it is inconceivable that, with the present accuracy of guns and rifles, some missiles should not from time to time enter out of the thousands fired every hour. Should one of those missiles be a shell, the fumes would destroy every occupant of the compartment. Even the bursting of a shell, charged with a high explosive, close to a loophole or embrasure would cause fumes to enter the corridor. The fumes would also penetrate by the ventilating holes in the roof and back wall. The supports and reliefs would similarly be reached by the fumes of bursting shells, and as to coming out into the open interior of the work to relieve their comrades or to help to resist an attack, the best troops could hardly be induced to make the attempt. To enable them, moreover, to quit the central bomb-proofs and enter the corridors, doors must be opened in both. These doors would be either large to enable men to pass out and in quickly, or they would be narrow, in which case the passing through them would occupy a long time. During this long time it would be strange indeed that a shell did not burst close to the door. It is possi-

ble that science may succeed in devising a means of applying a gas to neutralize the lethal effects of the carbonic oxide generated by the high explosive shells. Up to the present moment, however, no attempt in that direction has been made.

On duly considering what we have written above, we are disposed to arrive at the conviction that sieges in form will be impossible—a repetition of the successful siege of Strasburg in 1870 will not be attempted. A blockade, such as that of Metz, will rarely be tried, for, owing to the increased effective range, the radius of the surrounding circle will be so long that it is scarcely conceivable that a sufficient number of troops would be available for the operation. Besides, the history of the blockade of Metz shows that it ought to have failed had Bazaine acted loyally and energetically from the first. Everything, however, tends to the belief that a vigorous concentrated bombardment, in which the artillery fire would be supported by that of infantry and machine guns, would reduce the large majority of strong forts in from twelve to thirty-six hours. Of what use, then, are forts?—speaking only of inland fighting—we may be asked. Well, to tell the truth, with regard to permanent fortification forts are of little use, and the money and men absorbed by them can be turned to better purpose. Field works will, no doubt, prove useful to protect a bridge, railway junction, or a defile against the attacks of small bodies of troops. They cannot hold out long, it is true, against modern means of attack by a large force; but neither can permanent forts, and the increased time during which the latter can hold out would be too dearly purchased by the amount of money spent on them and the garrisons which they would require. Besides, troops holding a position garnished with field works would have for their object merely to check the assailant, and the defenders' intention would be to avoid capture by retreating as soon as they saw the enemy closing round them. Of course, the condition of the ground sometimes is such as to enable a fort to hold out, as in the old days, for several weeks, but we shall rarely find a fort so favorably situated. In future, therefore, we shall, in our opinion, confine ourselves to works calculated only to baffle a *coup de main* by a small force, and to check, not stop, a large force. After all, the military history of the past teaches us that, once the field army of the defenders is crushed, its so-called strong places soon fall, like over-ripe fruit, almost without any efforts on the part of the invaders.

The difficulty of forecasting the future is in the case of the art of war very great, for no sooner does one inventor produce an improvement in either an offensive or defensive direction than another inventor supplies an antidote. There is therefore a continual swing of the pendulum between offensive effects and means adopted to render them nugatory. However, one factor in war remains constant, and that is the nature of the ground. To utilize this to the fullest extent will be one of the chief objects of all who hold command, from the corporal with his squad to the general with his army, and the commander who has the best eye for country and understands how best to utilize it will have many chances in his favor when opposed to an adversary less gifted and less trained in that respect. In conclusion we may observe that though the war of the future may be more

dramatically dreadful, because locally more intense, it will not, as regards the entire body of combatants in the field, be more destructive than formerly. Probably indeed the proportion of killed and wounded will be smaller than it has been since the adoption of rifled artillery and small arms for reasons which we have given before. Greater perfection in the machinery and skill of the medical department will diminish the percentage of deaths among the severely wounded. Another circumstance tending in the direction of humanity will be shortness of campaigns. Their duration has been greatly diminished of late years, and we believe that in future it will be still more reduced. It is true that enormous masses of men are now brought into the field, and that such masses are necessarily slower in movement than small armies. On the other hand every ten years there is on the continent of Europe an enormous improvement in the means of locomotion and transport. The ordinary roads generally become better, single lines of railroad are converted into double lines and fresh railways are constructed. Owing also to the thick network of electric wires to be found in every country, there will be little waiting for orders or information. For these reasons the campaigns of the future will probably be shortened, and the shortening of campaigns means an enormous diminution of sickness and death by disease. It is not so much the weapons of the enemy as disease by which graves and hospitals are filled. As an example we give the following abstract of the losses in the 3d battalion Grenadier Guards during the Crimean campaign. Of non-commissioned officers and men, 111 were killed in action, 33 died of wounds, 650 died of disease, 442 were invalided (not included in the above), while 2 were missing. Of the wounded and invalided 96 were discharged and 851 returned to duty. Thus, if even the number of killed be increased by 50 per cent., a diminution to a like extent in the deaths from disease would, judging from the above sample, leave a large balance on the side of humanity.

NOTES ON TACTICS AND ORGANIZATION OF ARTILLERY MASSES.

By Major E. N. HENRIQUES, Royal Artillery.

From the Journal of the United Service Institution of India.

QUESTIONS of artillery organization and training cannot be properly considered without touching on larger topics, such as the established organization of the three arms, and the general conditions of warfare.

On two points in artillery organization and tactics there is practically complete agreement.

1. The six gun battery is the smallest tactical unit consistent with continuity of fire. On the other hand it should be noted that any increase would reduce the volume of fire, or else cause undue hurry, and therefore

imperfect fire control, which must seriously impair the effectiveness of fire.

2 The highest efficiency of artillery fire cannot be attained without unity of action, and this unity is not possible unless batteries are massed under one command.

I will now consider the sequence of events in a normal action, indicating how, in my view, the effective employment of massed batteries is influenced by tactical organization and the system of training.

The present organization of an army corps in three divisions, and a cavalry division,—each with its own artillery and the corps artillery besides, thus forming five separate fractions—appears to me faulty. It is seldom that three suitable roads are available to concentrate on the frontage required, for the deployment of such an army corps. If advancing on two roads, with divisions one behind the other on one of them, the deployment must take longer than in the case of the two division army corps. If advancing on one road or in an open country, there is no advantage in either organization. It will moreover be seen by the sequel that artillery, while it is influenced by this general disadvantage, will, in the employment of massed batteries, be subject to other adverse conditions, which render its deployment less rapid and effective.

Let us picture an army corps with its cavalry screen unable to advance further. The advance guard is in contact with the enemy's infantry, and its artillery has come into action. The cavalry division is being withdrawn and is to be echeloned on one flank by order of the general-in-chief, who is now reviewing the hostile position by the light of the cavalry reconnaissance. The order of the battle is then settled, and the general-in-chief indicates to the C. R. A. the relative positions to be occupied by the mass of artillery, in its relation to the advance guard in action.

The C. R. A.'s duties with the general-in-chief are for the moment ended, and he directs his attention to getting every available gun rapidly into position, in order to unmask the enemy's dispositions and to obtain as early as possible mastery over his artillery.

The disadvantages of the three division organization now become very apparent. It is an easy matter for a general to settle according to circumstances the deploying distance between the advance guards of a two division army corps, then to form the divisional artilleries on either flank, and to fill up the gap in the centre with the corps artillery. With three divisions it is quite another matter. The corps artillery may be divided to fit into the two intervals between divisions; or a very much larger space must be left in one of the intervals to allow the whole corps artillery to deploy; or, thirdly, the three divisional artillery units might be formed into one mass to fill one interval, and the corps artillery the other. Such formations may be criticised on tactical grounds, but the primary objection to them lies in splitting up the artillery force into so many fractions, and the suspense in which these fractions must remain for some time during their advance, before definite orders directing their deployment can reach them. Delays and countermarches must be the consequences.*

* NOTE.—Suggestions have been made to do away with the divisional and corps artilleries, and to form the whole artillery in the army corps into one body. I cannot but think this is a most dan-

The artillery of the advance guard has now probably been supported by the artillery of the cavalry division, and it will, if acting under more favorable conditions than described in the preceding paragraph, by its fire have focussed and drawn into its true position the advance at a rapid pace of the whole artillery force.

The C. R. A. will, before the arrival of the main forces of artillery, direct the following duties:

(1) Send out scouts to discover any cover which, during the withdrawal of the cavalry screen, may have been occupied by the enemy, and might thus become a source of danger to the artillery, while it is still poorly supported by the infantry.

(2) He will himself examine closely the selected position, and determine how it can best be occupied by the force at his disposal.

(3) He will examine with the greatest care the position of the enemy and all tactical points, assisted by range takers and his staff.

These important duties form one group and cannot well be divided. It is not easy to conceive, how they can be performed without loss of efficiency by the officers whose first duty is to lead their batteries into action. On the other hand, the intimate knowledge, which the C. R. A. would have of the general's plans, and the comparative leisure at his disposal, will, if he be furnished with a suitable staff, eminently fit him for the execution of these tasks. Moreover the grand mass of artillery will thus be formed up with more celerity and precision.*

For the first duty the establishments of batteries should be slightly increased, say four or five per cent. These six or seven extra men should be trained in scouting, reconnaissance, and signalling. They would also be used as orderlies and connecting links just as the French use their *agents de liaison*. The corps artillery would supply the C. R. A. with a sufficient force of scouts under an orderly officer.

Two or more groups of range takers should be at the disposal of the C. R. A. (taken likewise from the corps artillery) and should be set to work as early as possible by a staff officer, to take ranges of all important points, and such as are likely to become of importance during the action. The positions of the range taker should be well marked so that corrections from them can at any time be made. The staff officer in charge should be able to make a good panorama sketch of the battle-field, and mark on it all the ranges taken. In the hands of the C. R. A. such sketches will afford a most valuable key to the position of the enemy, and will enable him to give clear and precise orders to his batteries.

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gerous extreme. Provision must always be made for the sudden independent action of a division of all arms, and although a reserve of artillery is utterly unsound in principle, until the fight has to some extent developed, it is not easy to determine where the predominance of artillery will be required. Further, if the enemy were aware that so large a mass of artillery would be deployed in one continuous stream, it would be strange if he did not seize the opportunity offered by the infantry being delayed so much in rear, to push forward his infantry and to attack the ill protected artillery in flank. It is only by judicious combination of the three arms in deployment that such enterprises can be counteracted.

*NOTE.—Instances are on record (*vide* Prince Kraft) of commanding officers going forward to reconnoitre and losing their commands. Frequent unrecorded delays also, must have been the result of this procedure.

In the meantime the C. R. A. will have fixed the positions, and ordered the formation of the artillery fractions. The configuration of ground usually restricts the formation of artillery, and the line of guns follows more or less closely the crest line of the position. It is however very desirable with massed batteries, that some form of echelon from the leeward flank should be employed, to obviate smoke interfering, and to render the task of ranging more perplexing to the enemy. Echelons require somewhat more lateral space but with large masses of artillery, intervals must be left to enable small bodies of infantry to advance as occasion requires.

The officers commanding divisional and corps artillery, while leading their batteries to the front, will send their adjutants forward, to receive their orders direct from the C. R. A., as to dispositions, alignment, and manner of opening fire, etc. The adjutants will immediately return to their commands, and on their way reconnoitre the ground to be passed over, so that they may give the best information to their colonels as to the advance. It will frequently be found necessary to leave orderlies at fixed points to act as guides in coming into position.

The advance into the first artillery position is usually unmolested by fire. All ammunition wagons will kept with the guns as long as possible, and in no case should wagons ever be separated till the artillery has disengaged itself from the other troops on the line of march. The first line of wagons should follow their guns closely going into action and should have six horse teams. Under normal conditions the second line of wagons would be conveniently formed into three groups, and each stationed with a view to the supply of corps artillery and the divisional artilleries. Officers other than the captains of batteries, should be placed in charge. They should be responsible for the ammunition supply, and keeping up communications with the nearest bodies of artillery, and it must be clearly understood that the second line of wagons is to supply unconditionally the nearest batteries and any that may urgently require ammunition. The colonels commanding will, when they halt to prepare for action, indicate as nearly as possible the positions to be taken up by the wagons. The officer in charge is however responsible for its safety, and any subsequent change of position that circumstances may require, should immediately be notified to the fighting line. When ammunition has to be replenished in the fighting line, and no advance is contemplated, the same teams should take away the empty wagons, as it is useless to expose a double set of teams to fire.

The relative positions of the second line, the teams of the first line and gun limbers should be regulated by the following principles. Absolute security from frontal fire should be secured to the second line; the limbers and teams of the first line must preserve the connecting link with their batteries much more closely, and should only seek such shelter as is consistent with an ever watchful readiness to limber up. It is a debatable point whether under some conditions the teams of the first line of wagons may not with advantage be allowed the extra security of the second line. When the ground in rear of the artillery position is a dead level without cover, it would appear advisable that the limbers should keep on the move, advancing and retiring between 300 and 600 yards in rear. If they can still keep

up the required touch with their batteries, more security from fire will be found on a flank in rear of infantry, than immediately in rear of guns. To meet a sudden cavalry charge limbers should be taught to form "lagers" with the horses facing inwards, corresponding in a measure to infantry rallying squares. A few gunners with their carbines might then offer considerable resistance.

Whatever is to be the formation of the firing line, the advance into position of a large body of artillery should always be in echelon. Any trifling delay in unlimbering is quite insignificant in comparison with the advantage accruing in the accuracy of alignment and intervals, and the power which remains with the officer commanding, up to the last moment, of making slight alterations of alignment during the advance.

I cannot but think that the principle of denuding the fighting line of all horses has been carried to a dangerous extreme, and that batteries—especially when acting in mass—have now been left without sufficient means of communication. Single horsemen distributed in rear of batteries, would be quite as safe as any one, and without them a mass of artillery could not be worked for long in an efficient manner.

Each battery as soon as it has found its range should send a written report, giving the target, range, distribution and apparent effects of fire. This report would be transmitted to the C. R. A. who by comparison and observation will gain much information as to the enemy's position.*

In the meantime the infantry will have taken up its position in preparation for attack. The C. R. A. should have taken early measures, to obtain ample warning, not only as to the manner of the attack, but as to the precise moment it is to be delivered. Otherwise he cannot insure the wagons being full of ammunition at this critical stage. He will give general orders as to how the attack is to be supported, and tell off any fraction of the artillery, which may be required for special independent enterprise.

During the second phase the C. R. A. can no longer keep up the same detailed command of the whole artillery, as he has previously exercised. The mutual relation between the arms is now reversed. The infantry having, under cover of artillery fire, advanced into positions whence it can effectually engage the enemy, becomes the principal factor, and should occupy the most favorable positions. The artillery fractions now support the infantry, not by distant fire, but by themselves advancing to decisive ranges, wherever they can find positions. Combined artillery action, as understood in the first phase, is no longer possible, and its activity becomes more and more localized.

To carry out the general instructions received from the C. R. A. the colonels commanding fractions, will now have to select their own positions, decide on the exact moment of advance, and as far as time and other conditions admit carry out all the duties we have already assigned to the C. R.

*NOTE.—In the October, 1893, number of the Royal Artillery Institution Journal there appeared a translation from the Russian of General Dragomirov, in which it noticed that in some manœuvres under his command, a battery "when charged by cavalry, countercharged with its limbers." This idea of charging with limbers, wagons or guns, in position or on the march, has much to commend it. I have little doubt but that this mode of defense will in the next wars be tried, and it will probably add much to the confidence of artillery.

A. in the first position. Even in an open country unexpected obstacles are often met, and positions are rarely what they seem from a distance. It is therefore always advisable to reconnoitre more or less thoroughly the ground to be passed over and the position to be taken up. Usually the adjutant and range takers can perform these duties, but occasions will occur when the colonel commanding should personally examine the position. No halt to prepare for action should ever be made; in the previous position everything should have been made ready before limbering up.

The C. R. A. should now exercise a watchful supervision of the whole. His independent position and his close relations with the general-in-chief will enable him to foresee dangers, and seize advantages which would otherwise pass unheeded. He should take active measures, that the ammunition supply shall not fail at the supreme moment. He should anticipate success by organizing in good time the pursuit.

Having thus sketched what appears to me the essential points in fighting massed batteries, I will now examine the special features of peace training which these conditions appear in addition to require.

It is most unfortunate that the results of the artillery fire factor should never be apparent at manœuvres. However well handled the artillery may have been, the enemy will, if allowed, totally ignore its fire effect, and consider himself ill-used if required by umpires to accept losses. It follows from this that the time which is needed for the artillery duel is generally slurred over, and the action of artillery to a great extent restricted and effaced. To make any show at all the artillery has to keep moving with the infantry, and if it gets into action ahead of the infantry as likely as not falls into unexplored dangers, and is blamed for consequent losses. For this reason, and others which do not enter into the scope of this paper, we believe that manœuvres would afford far more profitable instruction, if they were separated into four phases, each strictly demarcated by time and topographical boundaries.

The 1st phase would be reconnoitring and the preliminary advance.

2d phase, the artillery cannonade and the formation of infantry lines of attack.

3d phase, the infantry attack supported by artillery.

4th phase, storming the position and pursuit.

Another prolific cause of irregular handling of artillery, is due to the C. R. A., with the small artillery forces seen at our manœuvres, being usually an officer of inferior rank. His position and status as C. R. A. are more or less ignored, he is ordered to take two guns here and two guns there, more like a corporal of a guard than a commander of a technical arm. The C. R. A.'s position is defined clearly enough by regulations. But, if in war he is to be held responsible for the proper handling of the artillery, it cannot be wise, that the mutual relations between the general-in-chief and the C. R. A. should habitually be set aside, instead of becoming fixed by constant practice.

From what has already been said, it will be evident, that, in my opinion four gun batteries, and batteries without wagons fully horsed, are very imperfect organizations for training artillery.

The present tendency of uniting two or more batteries under a lieutenant colonel is undoubtedly a move in the right direction.

But more than this is required. If batteries are ever to act in mass, they must be brought together in large bodies and with other troops, be practised in deployments, the conveyance of orders, etc.

Little need here be said regarding mobility, as its importance is well understood by all ranks. It requires, however, much practice with the other arms, and an intimate knowledge of the conditions of active service, for an officer when dealing with masses of artillery, to know how to spare his horses and men unnecessary fatigue.

Words of command should be reduced to a minimum, but the advocates of signals appear to us too exclusive in their practice. A combination of both, according to the circumstances of the moment, gives the best results. Signals are not only useful in themselves, but they have a most valuable educational merit. They train the attention and powers of observation in all ranks in a marked degree.

The central feature in all training for war should be the cultivation of that individual intelligence, which insures prompt action under every possible contingency. Our aims have hitherto been too exclusively in the direction of set movements and precise drill, and as a result little can be effected without leading strings. The actual conditions of warfare require that this automatic action should be supplemented, in a considerable measure, by individual intelligence, and that men should be trained to act correctly without always needing explicit words of command. For example, circumstances require a great variety of formations in the preparatory position. Whatever the formation may be, column of route, sections or batteries, at close or open interval, one word of command "March" should suffice for the advance. When detailed words of command are expected, the greatest confusion often follows the simplest movement, wagons not knowing whether to go on or stand fast, trying to form line and then falling back, etc., etc., and every one shouting to put things right. To obviate all this it should be left to the section officer to tell off the wagons for the 1st and 2d lines, they know best how the ammunition is packed, and which horses require sparing. The wagons of the second line should on no account move, till the fighting line has disengaged, and then the officer in charge will give any orders that are required. The last line of wagons have merely to stick to their guns (except when horse artillery is galloping) and avoid the manœuvring one so often sees, and which entails more fatigue to these teams than if they had been in the guns. If all this has been clearly explained to the drivers, and they have been taught to look out for themselves, no hitch whatever will occur. It is just the same forming up wagons to supply the fighting lines as long as it is attempted to reverse them by signal or word of command, delay, confusion and danger result. But when the drivers know exactly what is wanted, and that they alone are responsible for getting placed without obstructing the battery, things will go perfectly smoothly.

The examples here given are a few of the more prominent which have come under the personal cognizance of the writer. But the same spirit of simplification should pervade all field manœuvres. To this end, quickness

of eye, and perception,—a knowledge of all situations, and fearlessness to act promptly, should be inculcated in all ranks in various degrees. Irregularities of ground should be sought out, and men trained to make the best of them.

These remarks should not be construed to lessen in the least the value we attach to strict uniformity to be essential and that no addition or curtailment should be permitted in these matters. Any competent officer should at any moment and in any situation, be able to take over command of a strange unit, without causing the least misunderstanding or confusion. We consider further, that all troops should be systematically tested in this matter, and that thereby weak points in drill will be brought to light as well as irregularities in methods of training. Explicit detailed commands are not adapted to all situations, in such cases orders should be used merely as cues, which must be executed with comprehension. In the German field artillery drill this distinction is clearly kept in view, and the Emperor in his introductory order says, "the latitude in instruction, and application, which has been purposely left, is in no case to be materially restricted."

I will conclude with a summary of the chief points in training, which should come under the special care of colonels of horse and field artillery:

1. The conveyance of orders laterally and to the rear.
2. Keeping touch with wagons and ammunition columns.
3. Reconnaissance and scouting.
4. Signalling.
5. Selection of positions.
6. Preparing for action in any possible formation.
7. Grouping ammunition wagons in selected positions.
8. Long advances in echelon, and in line of battery columns.
9. The defense of wagons and limbers in case of sudden attack.
10. Flank movements to reinforce a distant part of position.

(Written in February 1894.)

THE SHOCK POWER OF THE SERVICE BULLET.

(From the United Service Gazette.)

ONE useful result likely to follow from the recent brilliant Chitral campaign is the ascertainment, as the result of experience in the field, of the actual service value of the Lee-Metford magazine rifle and its steel-coated bullet. The "stopping" power of the latter has so often been called into question that the matter cannot be too soon set at rest, and we are particularly glad to hear that a committee is sitting at Simla to take evidence as to its observed effects in the Chitral campaign. Experiences gained in the latter show, the *Calcutta Mail* declares, that the Lee-Metford, beautiful piece of mechanism as it is, errs, as that journal quaintly puts it, on the side of humanity. The day after the engagements of Malakand and Khar Kotel wounded Swatis were, it appears, met out and

about, and some actually came into camp with tiny holes drilled right through them, which did not seem to cause them any serious inconvenience. This we could well understand if these wounds were merely through muscles and fleshy parts of the body; but bones, including some of the larger ones, are declared to have been drilled through by the magazine bullet, and though the part was weakened it was in no wise disabled. Nor are these reported to be isolated cases, but to have been found to be the majority of wounds among the Swatis maimed in the above-mentioned actions.

So much at variance are these facts with the results of certain experiments made previously to, and at the time of, the adoption of the magazine rifle into the service, that it may well be asked how the discrepancy can possibly be accounted for. The true answer is, however, we think, to be found in the little-known fact to which a field officer drew attention a few days ago in the columns of the *Morning Post*, that the effect of a bullet, particularly a light one, fired at a high initial velocity, is far greater on dead than on living flesh and bone. In the latter there would really appear to be some non-resisting quality, for which we must confess ourselves unable to account, not possessed by dead flesh and bone. An Express bullet usually forms a crater in the flesh of a dead animal, and breaks up the bones; whereas in a living one it seems to be turned aside by the least obstruction, and merely passes through the body. The gallant officer to whom we have just alluded, who, if we mistake not, is one who has the fullest right to speak with very considerable authority on the subject, declares that he has shot a large quantity of game in India, chiefly with a .360 Express, but has never seen in the animal shot while living the terrible wound made by the same rifle on a dead carcase.

During a musketry course at Hythe he saw the Lee-Metford rifle tried at 200 yards range against a dead sheep. The bullet invariably carried away a large piece of flesh where it left the body, and broke up the bones in its course. This, we may observe, strictly accords with what we should have expected in the light of the results attained in the experiments we have previously referred to. Some time afterwards the same gallant officer was able, through the kindness of the medical officer at Normanton, to see three of the unfortunate men wounded in the Sharlston riots. They had all been struck in dangerous places, but the bullets had not made serious wounds. The men said they had not experienced any great shock, and were able to walk after being hit. No. 1 was hit in the left forearm. The bullet passed through the bone without breaking it, drilling a small hole, and the wound healed in a short time. No. 2 was hit in the right lung. The bullet passed through his body, breaking no bones. No. 3 was a more curious and more serious case. He was 500 yards from the squad. The bullet struck him about three inches below the right hip, almost in the centre of the thigh. It passed through the thigh, through the bottom of the stomach, and came out of the left thigh, at much the same place as it had entered the right. No bones were broken or vessels injured. When seen about two months after the wound had been inflicted the man could walk. It may be remembered that of the eighteen men struck during these

riots only two were killed: one was hit in the chest, the bullet smashing his spine; the other by a ricochet on the knee, which destroyed his leg.

The information, so far as it goes, which the *Pioneer Mail of India* has collected upon this subject received from those who were engaged in Chitral is not altogether conclusive. At the Malakand Pass and at Khar there were no rushes of fanatics in large numbers such as occurred at Ahmad Khel, in the Afghan war, and on one or two notable occasions in the Black Mountain expedition. Had there been, the magazine attachment of the rifle would have been resorted to, and the advancing tribesmen would literally have been met by a storm of lead and steel. Unfortunately, from the musketry point of view, this experience was denied us, and the problem remains yet to be solved in its practical form.

Only once, we believe, was the magazine used during the campaign. This was when a company of the Bedfords was rushed by a few fanatics at Khar Kotel. The numbers of men engaged were not sufficient to prove anything one way or the other, and in reality there was little occasion for magazine fire at all. But even then the enemy were enabled to advance almost to within a hundred yards before they thought better of their attack; and as the Bedfords are a fine shooting regiment it is possible that every man of the attacking party was wounded, though most of them were able to retire.

It is well established that the Lee-Metford has such enormous power of penetration that one bullet, as it is reported, was recently proved on the Northwestern Frontier, may hit and pass through two or three men. This, of course, can only occur at short ranges. What, however, is absolutely required, more particularly when dealing with savage foes, who, experience has shown, will keep on unless a wound instantly cripples them or brings them down, is a bullet that will give a sufficient shock to "stop" a man or horse. It seems, to say the least, extremely doubtful whether the present service rifle will do this.

There has been a growing fear amongst experts in rifle shooting that the actual "stopping" power of the steel-coated bullet used with the Lee-Metford magazine rifle, with which British troops are now armed, is not what it might be. This feeling has been created by the publication of the experiences of sportsmen who have been unable to bring down big game "in their tracks" immediately when the .303 rifle has been used, as with other weapons after similar hits they had been accustomed to do. This (remarks a morning contemporary) unquestionably is a most interesting and also an extremely serious problem. The proposition, in a military sense, is will the bullet, which some have called the "lead pencil," on account of its thickness being little more than that of an ordinary cedar pencil, stop a fanatic in full charge? It is long, thin, and light, and leaves the muzzle with a very high initial velocity. If it strikes a big bone it is supposed not only to smash it to pieces, but also to splinter it for several inches up and down. Thus a man struck on the hip or knee joint, or on the point of the shoulder, would be terribly injured, and would be brought down immediately. Whether the bullet will do this is exactly what the military authorities wish to ascertain, for there are stories afloat of a hole having been simply drilled

through a large bone without any splintering at all, and also in the recent campaign at Chitral of men continuing their wild onward rush after a bullet had passed through their bodies.

These statements are so extraordinary and so contrary to the reports of experiments carried out on animals, both in India and in Europe, with small-bore rifles, that they cannot be accepted without full and careful inquiry and the production of most trustworthy evidence. There does, however, seem to be good reason for believing that the Lee-Metford bullet passes through the thinner bones of the human body, such as the shoulder-blade, ribs, and breast-bone, without having any smashing effect. In such circumstances it only drills a small hole through the body, and the shock is consequently but trifling. Similarly, when striking muscles or soft tissues, it does not tear and break up the flesh like the larger, uncoated lead bullets used in the Snider and Martini-Henry rifles, nor, as these did, in cases where they passed through any part of the body, does it leave a great torn hole on exit. The seriousness of the matter lies in the experience we have gained in the wars of the last twelve or fifteen years, which is that savages take small account of a wound that does not instantly cripple or bring them down. In these circumstances it follows that, although an incomparably superior shooting weapon to either, the "moral" effect of the Lee-Metford is less at short ranges than that produced by the Snider or the Martini-Henry.

Expert opinion is certainly much divided with regard to the extreme and clean penetration of the Lee-Metford bullet. It has been suggested that it was upon humanitarian grounds that the authorities adopted an envelope for the pellet that is harder than is actually required, in order to enable it to pass through the barrel with its severe rifling without stripping. There are those who look upon penetrative power as the great and only object to be obtained in the Service bullet, and there are others who consider that all that is necessary is attained for military purposes when a projectile has been devised that will effectually "stop" either a man or a horse. In any consideration of this subject it would be well to warn those who interest themselves in it not to be misled by the stories told of the wonderful results obtained by the Lee-Metford against big game. Sportsmen, as we are reminded, who use the rifle slit the thin metal covering of the pellet, in which condition it unquestionably gives good results. In warfare, such an expedient would not be permissible—indeed, it is barred by the articles of the Geneva Convention. The time is an opportune one for the investigation which is still proceeding, from the fact that the incidents of the last of our own "little wars" are still fresh, and by way of parallel we could do worse than seek for assistance in the records of the recent Chino-Japanese war, in which the Japanese used a rifle nearly similar in calibre to our own.

Military Notes.

FIELD ARTILLERY FIRE.

MAJOR A. J. HUGHES, R. A., of the School of Gunnery, Shoeburyness, delivered a lecture at the Royal United Service Institution, on "Field Artillery Fire and Okehampton Experiences."

Having briefly described the latest changes that have been made in matériel, the lecturer went on to say the conditions of peace practice are so different to those on service that only the most general deductions can be made from many peace results. They are, perhaps, of more value to show the gain made year by year in destructive effect produced by improved training and matériel. But even here great care must be exercised and large averages taken or the deductions will be misleading. One often reads in the papers the wonderful results of some special trial of a new gun, and comparisons are drawn between them and those obtained at ordinary practice, quite ignoring the fact that at these special trials everything is done to obtain effect. Perhaps, on the whole, the effects obtained from artillery practice are more likely to be approximately realized on service than those of infantry practice. In the description given by Major May in his "Achievements of Field Artillery," he says, speaking of the battle of Gravelotte, "Hasse's battery from the first sustained enormous losses. Two other officers were severely, and Capt. Hasse himself was slightly, wounded. All the officers' horses were shot, but, in spite of the sacrifices it had to make, the battery held its ground and maintained its fire with great effect." And again, at Spicheren, speaking of the two batteries that were first able to reach the heights, he says, "Although these eight guns lost nearly half their gunners, fighting as they were within 800 yards of a line of French skirmishers in shelter trenches, the effect of their shells compelled the enemy by degrees to abandon the field, and the remaining four guns of the heavy battery were able to come into action too, and added their force to the power which was overpowering the foe." In this respect artillery should make a further advance by the introduction of a non-recoil carriage, for one of the most exhausting labors of working the guns is that of running up. Thus in Egypt, in 1882, in the account of the action on August 24, we read the two detachments of the two guns of N. Battery, A Brigade, became so exhausted towards the end of the day, on account of the heat and labor of running up, that first the drivers and then some marine artillerymen assisted them.

Rate of Fire.—At practice the series are so short, in consequence of the small amount of ammunition available, that the rate depends more on the ability of the battery commander to find the range and fuse quickly than

on the working power of the battery. At Okehampton the average time taken in opening fire, *i. e.*, from action to first gun, was 1 min., 10 sec., and from action to ordinary fire, 5 min., 53 sec., whilst the whole time in action only averaged 8 min., 43 sec. This also is against large effects, for directly the range and fuse are found, that is, when the fire becomes effective, the series is stopped.

Cavalry.—At the cavalry target the rate ran up to 13.5 rounds a minute. The average at this target of the batteries practising at Okehampton being nearly 10, with smokeless powder it will, doubtless be increased. The system now introduced for meeting an attack at close ranges—1000 yards and under—is very simple, and is as follows: Previous to coming into action, three shrapnel, with fuses set at two, are placed in a portable magazine (one of the leather cases used for carrying ammunition from the limbers to the guns). When the guns are in action, this magazine is placed close to the loading number. The left sight is fixed at 500 yards. Suppose the battery is firing at a distant target, and is suddenly attacked by cavalry, the order "Magazine fire" is given. On this the guns are at once turned on the cavalry, and the three rounds per gun already prepared are fired at the fixed elevation of 500 yards. The shrapnel having their fuses set at two burst at about 400 yards from the guns, and at such a short range the bullets cover about 300 to 400 yards in depth; and with the rapid fire that can be kept up, in consequence of there being no delay setting fuses or sights, the ground from 400 to 1000 yards should be well swept with bullets. When fused shell are carried, a battery will always be prepared for cavalry, as all the fuses can be set at two.

Artillery.—The average results of the last three years, namely, 8.5 men hit out of 38 in 11 min., 52 sec., for an expenditure of 24 shell may, I think, be taken as fairly representing what a 12-pounder battery can do under ordinary peace conditions in the time, and for the amount of ammunition expended. Guns are undoubtedly our most difficult target, both on account of the range (averages about 2700 yards) and extent of ground covered by the target. The effects, consequently compare unfavorably with those obtained at other targets; still nearly one-fourth of the target destroyed in 12 min. is not really bad for so large an average (78 series), more especially considering that at Okehampton the ground is entirely unfavorable to ricochet. That ricochet does largely influence the effect on the target is clearly shown by the fact that the results at practice grounds favorable to ricochet are year by year greater than at Okehampton, notwithstanding that the batteries change over. In an interesting experiment at Shoeburyness it was proved that the effect of time shrapnel, at a range of 2000 yards, was 35 per cent. better over hard ground than over soft, at longer rauges the advantage is less on account of the increased angle of descent and lower velocity, and at ordinary practice the difference is probably not so marked. One of the hardest targets to obtain effects on at Okehampton is that of the guns on the Bluff, and the difficulty is chiefly one of ranging, due to there being a depression in front as well as in rear of the target. The guns themselves can generally be clearly seen, but unless the ground is known the dip short of the target can easily escape notice, and shell pitching in it, not being seen,

are judged over, thus throwing out the ranging. Sometimes the smoke, when it rises from the depression, is so thin, that the target shows up through it, thus the observer concludes the shell is over. Prince Kraft, in his thirteenth letter, draws attention to this, and relates two cases of this occurring—one at peace practice and one on service. Concerning the latter, he says: "I once saw in action a considerable line of artillery, which was engaged near to me, firing for several hours too short, and this went on until I remarked it and informed them of it. The enemy had posted his guns on the further edge of a plateau, in which there were some deceptive depressions; while our artillery was induced by similar appearances of the smoke to believe that they were standing close to the nearer edge."

Infantry Column.—The effects on columns, owing to the depth of target, are almost invariably good, even when the front is quite narrow (such as a column of fours). When one has both depth and front the results are greatly increased. In India the conditions for the first series of the competitive in 1893–94 were: Range unknown, but between 2200 and 2600 yards. Ammunition unlimited, time 6 min. Target, three columns of fours, 30 dummies in each, and 25 yards interval between the columns. The average result of all the batteries (41) was 665 hits and 37 shell fired. The best was 2010 hits and 45 shell, *i.e.*, 335 hits per minute, or 44 per round It is, however, only fair to say that the Indian dummies are 6 ft. by 2 ft.. and that the targets are sure to have been very distinct; for when a competition takes place between different stations it is only human nature that each camp should place their targets in the most favorable position for effect. Even making allowance for this, the result is striking.

Infantry Line.—A comparison of the vulnerability of standing and kneeling dummies in a single line is given by the average results of the second and third series of the competitive. The conditions for the second series were: Target, 45 standing dummies in single line, at one pace interval, range unknown, but between 1800 and 2300 yards; ammunition, 24 rounds. For the third series the conditions were the same, except that the dummies were kneeling, and the range between 1400 and 1800 yards. At the standing dummies the average was 106 hits on 31.4 dummies, whilst at the kneeling it was 94 on 31. Thus it appears as though the reduction of the range by 500 yards about compensated for the smaller target. This example, however, does not by any means show the full gain, for it is more, on account of the greater depth covered by each shell that increased effects are obtained as the range decreases. In this respect the present guns and ammunition are far ahead of the old. The report on artillery experiments at Okehampton in 1875 says: "Fire directed against the first or attacking line produced virtually no effect against the supports or main body. The distances were such as to render the ricochet of fragments harmless, and therefore if the fire were directed against the attacking line alone the general advance of the main body would not be impeded." The experiments on which this opinion was based were carried out by 9 and 16-pounder batteries at ranges from 2100 to 1000 yards, the distance from the front line to the supports was 210 yards, and supports to reserve 300. Last year a somewhat similar target was fired at. It consisted of three lines—first, 90 kneel-

ing dummies; second, 70 standing; third, 24 hessians (6 ft. by 6 ft. canvas screens). The distance between the first and second lines was 200 yards, and between second and third nearly 300; range to front line, 1000 yards.

The battery fired 56 rounds, all at the front line, in 9 min., 40 sec. The effects were—first line, 327 on 84; second line, 82 on 44; third, 22 on 13. The result on the second and third lines were all fairly due to the depth of the shrapnel and not to exceptional rounds, because in the whole series no time and only two percussion shell burst beyond the first line. This experiment seems to show that at short ranges (1500 and under) fire directed on the front line will be effective on the supports and reserve. The question therefore arises, What advantage is gained by dividing the attacking line into firing line, supports, and reserves? Any material increase of distance of the supports and reserves with a view to escape the effect of the fire directed on the firing line would render the object of having supports nugatory, for they would not be available as reinforcements at the moment they were required. Last year two interesting lectures were delivered here on the attack. In one, great stress was laid on a formation to give as little loss as possible, and percentages were given to show that, theoretically, men dispersed at 8 yards interval, and in rows of 9 yards distant, would suffer less loss than the same men in line. In the other the chief stress was laid on facility of control. The results of artillery practice appear to be all in favor of the latter. In any attack losses are bound to occur, and, as far as artillery effects are concerned, will be much the same whether the men are in one, two, or three lines, since the distance between lines cannot be sufficient to prevent shell aimed at the front line taking effect on the second and third. The best formation, therefore, is that which gives most control, and consequently greater fire effect, on the principle that the best protection from the enemy's fire is in our own. Even against rifle fire the same argument holds good, for men, as a rule, fire high, and consequently the front line is often safer than the support or reserve. This seems far borne out by results, for in the April, 1894, number of the *Royal United Service Institution Journal*, in the notice of Hoenig's account of the attack of the 38th Brigade, it is stated: "It appears that the companies that advanced in two-deep line formation maintained their cohesion and fire control longest and best; and, turning to the casualty returns we find that that their losses were fractionally lower also." Major Macartney, in an article in the *United Service Magazine* of October, 1894, says: "It seems absurd, considering the far-reaching power of the weapons in the hands of infantry, to hold back a fraction of men 150 to 200 yards in rear of the fighting line. They are equally safe and can use their rifles in the front itself, but in rear they only add to the depth of the formation and increase the danger. Of the 113 hits made on the 134 dummies at 1400 yards, in an experiment at Hythe, no less than 77 were on the supports. Why not abolish them by at once placing them in the firing line and keep the reserves as far out of harm's way as is consistent with its being able to afford support?" Abroad, the opinion seems to be in the same direction, and the support is, in many cases, merged in the firing line from the commencement.—*The Army and Navy Gazette.*

CAVALRY MANŒUVRES.

Col. J. D. P. French, 19th Hussars, delivered a lecture yesterday at the Royal United Service Institution on the "Lessons to be Drawn from Cavalry Manœuvres at Home and Abroad."

The lecturer said at starting that he wished to repudiate any intention of a controversial nature, only desiring that his efforts might find sufficient favor to initiate a discussion and full expression of views, from which might be gleaned such instruction and matter for thought as would prove of value to the cavalry service generally. Having considered the characteristics of some of the most important cavalry concentrations which have taken place in Europe during the last 70 years, Col. French went on to say: "Some time ago, however, Gen. Lord Roberts, when commander-in-chief in India, took the lead in giving practical effect to the long-recognized and oft-expressed need for annual independent cavalry manœuvres. A cavalry camp was formed in the Punjab in the winter of 1887, under the command of Major-Gen. Luck, C. B., Inspector-General of Cavalry in India, since which date cavalry manœuvres have become an annual institution in that country. Lieut.-Gen. Sir Evelyn Wood, when in command of the Aldershot division, initiated cavalry manœuvres in this country. In all the cavalry camps, both here and in India, the programme has generally consisted in a certain number of independent brigade drills under brigadiers, followed by similar exercises of the combined division; and finally the force is divided into two opposing brigades or divisions, according to its strength (brigades in this country, divisions in India), which manœuvre against one another, starting a considerable distance apart, under general and special ideas set by the director of manœuvres. During manœuvres, opportunity is taken to test new equipment and proposed methods of carrying kits, while experiments in forage and management of horses in the field are tried. The manœuvre reports of the inspectors-general at home and in India are full of valuable comments, bringing to light errors and shortcomings, the existence of which were more or less unknown, or quite ignored, in former years. Looking at the results of our cavalry manœuvres as compared with those of Prussia, it cannot be said that ours have borne fruit in the direction of new regulations and instructions for employment of cavalry. No doubt after cavalry manœuvres have become an annual occurrence in this country, we shall find that British methods of handling cavalry will be second to none either in originality or in practical execution. Yet, notwithstanding the absence of new ideas, our cavalry manœuvres have not been unfruitful. Foremost amongst the advantages which have accrued is, I think, the estimate which they have enabled us to form as to the efficiency and readiness of our cavalry to carry out its rôle in war. The real object of manœuvres is to accustom the cavalry to act together in masses, in strict accordance with certain ascertained rules and methods; to train it as the great pioneer force of the army in the field—the eyes and ears of the commander-in-chief. The work to be carried out is, therefore, designed with a view to practising in large masses: (1) That training in reconnaissance, a complete knowledge of which should have been previously acquired in the smaller units of regiments and squadrons; (2) drill, manœuvre, and attack; (3) rapid concentration of the divis-

ion in any given point; fight of the division against a skeleton enemy; exercises of opposing bodies. Only when complete efficiency in these points is attained, and the hostile cavalry is defeated and driven from the field, will the road lie open to the carrying out of that great strategic task of cavalry in modern war—the lifting of the veil which shrouds the enemy's movement.

"Calling to mind our most recent experiences of reconnaissance in peace manœuvres, viz., the work carried out in Berkshire on Sept. 2 and 14 of last year, I ask, Do the results justify us in a belief that we give sufficient time and attention to this most important subject? The official report of the Inspector-General comments at some lengths on our deficiencies in this respect. What first seems to me to require closer attention is the instruction of patrol leaders. In the various exercises which prepare masses of cavalry for the fight, the annual manœuvres exemplify, perhaps, their principal necessity and value. Divisional drill and manœuvre are designed to train the division for the fight, more especially in qualifying subordinate leaders of lines, regiments and squadrons for successful leading of their commands in line tactics by stimulating rapid mutual understanding between leaders, quickness of eye in rapidly grasping the situation and arriving at immediate decisions. A clear distinction must always be drawn between 'drill' and 'manœuvre,' and it is a question worthy of serious consideration whether the greater portion of the time at disposal should not be devoted to 'drill.' But by 'drill,' be it understood, we do not mean to imply that our division or brigade is to be exercised as if the squadrons were pieces on a chess board, and that complicated movements of an ingenious nature should be practiced at a slow pace. Drill should consist of many evolutions of the simplest kind, rapid deployments from mass to a fighting formation in any direction; long advances at varied paces over every kind of ground, followed by a charge, break-up and rally, and perhaps another charge; and it should be borne in mind that the object on which the charge is to be made should be invariably indicated. First of all that object may be stationary, but finally it should be a moving one. Men with flags or discs are employed for this purpose. By this means much instruction can be given as to the handiest methods for attack, or to parry an enemy's attack according to the nature of the ground. Similar cases should be worked out to suit varying circumstances. I am strongly opposed to the idea that inspiration will teach us at the last moment what formation to employ. It seems more practical to work out as many cases as we can; subordinate leaders will then get a better idea of what is required of them, and what evolutions the efficiency of their squadrons will justify them in attempting. I would call attention to the advantages to be gained in instruction from the use of single-rank formations. When drill ground and strength of establishment admit, a regiment can be formed as a brigade. Leaders thus get practice in leading higher units than they would in regimental parades. In the drill of the division it is perhaps needless to point out the vital necessity for constant attention to 'pace' and 'direction.' Those of us who have had experience in divisional exercises know well how difficult of attainment is proficiency in these respects, and how all-im-

portant is their correct performance in the cavalry fight. A most important question is the choice of the moment for full deployment into a fighting formation. A too early deployment sacrifices the full power of manœuvre, discloses one's intentions, and abandons advantages of ground for cover. A late deployment means risk of surprise. Correct estimation of space and time is most necessary for every cavalry leader, but more than any for the divisional commander. The disposition of the lines of a division deployed for manœuvre previous to the attack, the rôle each has to play under constantly varying circumstances of ground and hostile dispositions, are matters of the greatest moment to secure success in the fight and imperatively demand constant attention and recurring practice. The number of squadrons to be placed in first line must depend on the ground, and on the known or estimated strength of the enemy.

"Frederick was in favor of the strong first line. Napoleon, an artillerist, had not the same knowledge of the details of cavalry tactical manœuvres. The French cavalry was thus weak in power of manœuvre, and Napoleon hoped, by means of masses and successive lines, to make up for this want of training, and so to discount the victory of the first line of an adversary. There are, however, many disadvantages in a strong first line. It is unwieldy, and it often happens that squadrons sent to reinforce it may be badly wanted elsewhere. The nature of the ground will also very often only admit of small fronts. All who have experience of divisional manœuvres must allow that what, more than all, requires constantly recurring practice is the conforming of the second and third lines to the movements of the first, and the intervention of the former, sometimes by flank attack, sometimes by flank defense, in support of its attack. Nothing is more urgent to insure success than the skillful and intelligent handling of the second and third lines, and of all the operations of a cavalry division none present greater difficulties or demand such constant practice. Following on the same plan of instruction, cavalry should be trained to form rapidly for attack on infantry and on guns. The form of attack by a cavalry division or infantry which seems now to find most favor is, briefly, as follows: The exercising of opposing bodies, with which it is customary to culminate the annual manœuvres are undoubtedly of great importance. Their real value seems to me to lie in the fact that two forces, posted many miles apart, approach one another under conditions which illustrate an intelligent, warlike situation; that they reconnoitre and report on each other, with a special object in view, the correct fulfilment of which must bring them into contact in some part of the ground unknown beforehand to either. Thus each leader finds himself confronted with the solution of a problem, the conditions of which arise suddenly, and have reference to the adaptation of his troops to the ground upon which he finds himself, and to all he can see and hear of his enemy's disposition. This demands on his part a thorough knowledge of manœuvre as applied to any kind of ground, ready resource, and prompt action. Commanders of lines, regiments, and squadrons have opportunities of displaying intelligence and initiative in carrying out the plan of the general, and mutually supporting one another, and thus that 'rapid mutual understanding' between leaders and subordinates, spoken of by General von Schmidt as so

all-important in the cavalry fight, is fostered and realized in a manner which such exercises alone render possible in peace-time. The proceedings of both sides are carefully watched by the director of manœuvres, assisted by an experienced umpire staff, and mistakes made not only by commanders but by all leaders, are discovered, noted, and commented upon with a reality which would be impossible in an ordinary drill or manœuvre against a marked enemy. I think the system of annual manœuvres has given us most valuable experiences in the important subject of the combined action of cavalry with horse artillery and machine guns. And, first, let me notice a statement recently made on this subject by a very able lecturer at Aldershot, whose opinion on all military subjects is of value, that no historical examples exist by which we can judge of the practical use of horse artillery with the cavalry division. I am not prepared to deny this; and, coming from such a speaker, we must allow that, if any examples of such action do exist, they must be somewhat obscure. What I fail to see is, why this argument should apply to guns of the present range and calibre. When the field of action of horse artillery was confined to a range of some 500 or 600 yards, it is quite conceivable that their action could have exercised but little influence on the course of a cavalry combat; but surely it is quite another thing when the same or greater results can be attained at a range of over a mile or more. Their field of action is immensely extended, and in this respect the improvement in artillery has rendered it a far greater power to cavalry. During the fight the officer commanding the artillery—like all other leaders of units—must not hesitate to act at once on his own initiative when he sees the necessity for doing so. He cannot wait for fresh orders. The highest standard of technical training is demanded of horse artillery. The greatest mobility is required, coupled with ability to produce a great fire effect in the shortest possible time. Only under these circumstances can cavalry get real value from the support of artillery. The most valuable acquisition which modern inventions have conferred on cavalry is machine guns. I think we have hardly yet realized what invaluable assistance and support their great mobility and rapidity of fire will render a cavalry force in the field. Amongst the many advantageous results which have accrued from these cavalry manœuvres, discussion has been aroused and consideration directed to our existing cavalry organization and system. Cavalry manœuvres have undoubtedly brought certain failings to light. Both here and in India manœuvres often show that there is a want of a sufficiently uniform system of training and instruction, which can only be attained by a more extended brigade organization and the maintenance of units more nearly approaching a war strength, The result of such defect is shown at these camps, when nearly one-half of the invaluable time has to be taken up by brigade drill instead of extended reconnaissances, practice of concentration, divisional drill, and manœuvre for the fight. I venture to offer it as a primary subject for discussion whether a great deal more could not be done, and greater efficiency attained, under a different system of organizing and distributing the cavalry in the United Kingdom and in India. In conclusion, I would strongly urge for consideration and discussion the absolute necessity for annual cavalry manœuvres."—*The Army and Navy Gazette.*

TEMPERING OF ALUMINUM.

The successful tempering of aluminum so as to give it the consistency of iron is the latest triumph of F. Allard, the Levis blacksmith, whose rediscovery of the lost Egyptian art of hardening copper startled the mechanical world some three or four years ago, and only failed to make the fortune of the author because of the expensiveness of the project. A recent trial of Allard's tempered aluminum has proved the success of his method and the practical purposes to which it can be applied. After having given the resistance of iron to a number of articles manufactured by him out of aluminum, he has made and hardened a cannon, which has just been tested in the presence of Colonel Spence, the American Consul here, and a number of other dignitaries, with the greatest success. This cannon is 28 inches long and 5 in diameter, the metal of the gun outside the bore being only a quarter of an inch thick. A charge consisting of a pound of powder has been successfully fired out of this little piece of ordnance without leaving any appreciable effect upon it.

A new and more scientific trial of the cannon has been ordered by the Canadian military authorities to be held at the Quebec Citadel by the artillery experts there, and the United States Consul, in view of this move, is understood to have encouraged Mr. Allard to manufacture, as soon as possible, a cannon 12 feet in length for direct shipment to Washington, but whether this is to be at Allard's risk or by instructions from the United States Government is not known and cannot be learned here. The cannon just tested weighs 14 pounds in all. If it were of iron and the same dimensions it would weigh 180 pounds. In appearance the finished specimen looks as though it was made of burnished silver.—*A. and N. Register.*

NEW BRITISH NAVAL GUNS.

According to the report of the British Secretary of the Navy the manufacture of guns has made good progress. The 30.5 cm. wire guns have been tested with splendid result. In addition to the 26 guns of this kind partly finished, partly under construction, 19 other such pieces are to be manufactured for completing the armament of the vessels of the *Majestic* class. In true recognition of the importance of quick firing guns all cannon below 15 cm. calibre are in the future to be quick firers. The experiments begun toward the close of 1893 of converting the 10.2 cm., 12.7 and 15.2 cm. guns into quick firers have been crowned with success and the conversion is now to be taken in hand on a large scale. Smokeless powder (cordite) has been adopted for all quick firers and for the 23.4 cm. and 30.5 cm. guns. The carriages operated by electricity for the 25.4 cm. guns on the *Barfleur* have stood the test well and open fair prospects for further development of the system.—*The Militaer Wochenblatt.*

BRITISH FIELD GUNS AND HAND ARMS.

According to the report of the British Secretary of State for War for 1895 the field artillery is to be increased by 7 field batteries, so that hereafter each corps will have 102 guns. The requisite 42 pieces are to be taken partly from the horse artillery; to be replaced by new wire guns C-91, of the same calibre, 7.6 cm., as they are turned out at the gun foundry at

Woolwich. The horse batteries retain the present projectile of 5.67 kg., while the field batteries carry the recently adopted new projectile of 6.8 kg. Initial velocity of both projectiles is 470 m. The manufacture of the 7.7 mm. Lee-Metford rifles has so far progressed, that the whole active army at home and in the colonies, as well as the militia, has been armed with it; the rifles now being turned out are for the reserve troops.—*The Militaer Wochenblatt.*

DAUDETEAU-BERTHIER RIFLE.

The Hotchkiss Ordnance Company has brought out a new rifle which is said to be a judicious combination of the Berthier bolt with the rest of the mechanism of the Daudeteau rifle. The Berthier bolt is very simple, containing but 8 parts, and is easily and quickly dismounted without the assistance of instruments. The cartridges, 5 in number, are held in a clip placed in the magazine from above. A cut-off to the magazine is provided to allow of single shot firing, and the arrangements are such that a new cartridge cannot be made to jam with an empty shell which has not been wholly ejected. The object of the company is not to bring out a fresh competitor for military service, but rather one for the geneal market for any purpose whatever.—*Lieut. Van Duzer, U. S. N.* (*United Service*).

COMPARATIVE TRIALS OF GUN-COTTON POWDERS.

Comparative trials were made last week with the following leading gun-cotton powders. The British .303 service rifle and bullet were used: Normal—10 rounds; powder charge, 30; muzze velocities in feet: 2016 maximum, 2006 mean, 1995 minimum; pressures in tons: 15.3 maximum, 15.1 mean, 15 minimum. Rifleite—10 rounds; powder charge, 39; muzzle velocities in feet: 2140 maximum, 2124 mean, 2104 minimum; pressures in tons: 21.9 maximum, 21.2 mean, 20.2 minimum. Walsrode—10 rounds; powder charge, 35; muzzle velocities in feet: 2048 maximum, 2021 mean, 2001 minimum; pressures in tons: 23.7 maximum, 22.11 mean, 21.8 minimum. Cannonite—1 round; powder charge, 37; muzzle velocity in feet: 2078 mean, pressure in tons: 25.2 mean. Only one round was fired with cannonite, as it gave a pressure of over 25 tons and broke the steel pad in front of the copper cylinder. The weather was bright and clear with a dry atmosphere.—*United Service Gazette, July 20, 1895.*

CORDITE.

It is understood that the British War Office authorities are not quite satisfied with cordite, which, while getting the very best results from the magazine rifle, has some serious drawbacks. It is said to corrode the barrel, and its fouling is of a sticky character, which requires to be removed while warm with a wire cleaner, which, it is suggested, injures the grooving of the weapons. The tendency to clogging is also alleged to have disadvantages as regards accuracy of aim. No doubt is felt that these objections may be overcome, but no method of doing so has yet been discovered, and meanwhile they are held to seriously impair the value of the Lee-Metford rifle.

In connection with the cordite question we reproduce from an Indian contemporary an account of an interesting experiment carried out recently beyond the frontier. Some rounds of cordite ball-cartridge were taken

from a man who, after accompanying his regiment to Dir, was sent back to Khar, in the Swat Valley. Two of the cartridges had been kept in the plaits of his coat since the campaign began, and all the ammunition had been wetted several times. Ten rounds were fired by a marksman from a sand-bag crest, the distance being about 500 yards, and the target, 6 by 6 feet, marked off in squares of one foot. The wind was slight from the right rear. The mean deviation was found to be only 3.46 inches. The officer who superintended the experiment reported that the ammunition was in first-class condition in all respects, and considered that the mean deviation could hardly be improved upon. The cordite had thus stood the great heat of the Swat Valley, the cold of the Janbatai Pass, and the heavy rain storms on the Panjkora, and had not deteriorated in the least.

CASUALTIES AMONG THE MEDICAL CORPS IN CHINA.

A French military attaché with the Japanese army says: "The casualties in the medical corps during the battles with the Chinese have been enormous." The authority is unimpeachable, and yet we are told that there is no difficulty in showing that four per cent. of the total number killed and wounded were doctors. Even if the attaché were referring to casualties amonst officers only the proportion would still be excessive, but he says expressly, killed and wounded of all grades. "These results," says the attaché, "which leave far behind them the most unfavorable statistics hitherto recorded, are to be attributed exclusively to the longe-range arms of modern times. The question of protecting ambulances in the event of a European war is one that calls for immediate attention, for, under existing conditions, the carnage could not but be enormous."—*Army and Navy Gazette.*

TREATMENT OF WOUNDS IN WAR.

In opening the section of surgery, which met at the Medical Examination Hall, on the Thames Embankment, Sir William McCormack, president of the section, delivered an address on "Some Points of Interest in Connection with the Surgery of War." He said that the modern rifle had introduced changes which had excited universal attention. This weapon sent a small hard projectile with enormously increased velocity to a much greater distance, and with greater precision, than was previously possible. The cylindro-conical projectiles of the Minie rifle and the Chassepôt, and the ovoid bullet of the needle-gun, were an immense advance upon the round bullets of Brown Bess, but the new projectile possessed even greater advantages. Our troops used the Lee-Metford rifle in the recent Waziristan expedition, and later in Chitral. In storming the Malakand Pass during the advance to Chitral an immense quantity of ammunition per man was used. The Lee-Metford, with cordite powder, worked very successfully. The volleys even were almost smokeless and noiseless, and wrought great havoc in the enemy's ranks. The factors which determined the amount of damage inflicted by a gunshot wound were the unalterable form of the projectile, as well, of course, as its size, the velocity on impact, and the resistance of the tissues struck. Hitherto about nine-tenths of the wounded on a modern battle-field were disabled by rifle bullets, and the proportion would

not diminish with the use of magazine rifles firing some 60 shots a minute and carrying immense distances. During the last 20 years there had been a gradual diminution of the calibre of the rifle and in the weight of the projectile, while its hardness had been greatly increased. The explanation of the extraordinary development of explosive effect seemed to depend on the rapid arrest of the flight of the bullet on piercing fluid matter, and its motion being transferred to the parts immediately surrounding it, and these again transmitting it to parts further removed, just as wave circles were produced by a stone dropped into the smooth water of a pond. The 900 experiments made by the German War Office did not justify Bruns's classification of gunshot injuries into groups according to range. As the range increased there was a gradual diminution in the velocity and energy of the projectile, and a corresponding diminution was observed in the extent of the injury. Perhaps the most important matter to consider was how far the injuries inflicted by the new projectile would be more amenable to successful treatment. In a memorable paper communicated to the first congress of German surgeons, Volkmann pointed out that the subcutaneous character of gunshot injuries of bones and joints made them less dangerous than compound fractures with more extensive damage to the soft structures produced by other causes. Subsequent experience had helped to confirm this view. Pirogoff had told us how astonished he was at the easy manner the wounds produced by the small Circassian copper bullet healed during the Russian war in the Caucasus, Not only flesh wounds, but often penetrating injuries of the chest and of the joints, were readily recovered from with scarcely any suppuration. During the recent war in Chili, it was reported by Dr. Stitt that flesh wounds, which had not been probed and thus infected, readily healed under a scab; that the favorable character of lung wounds was especially noticeable; and that the bones were less comminuted, and united in about half the time formerly required. Dr. Rivero of Valparaiso had made similar observations. He noticed especially the smallness of the apertures caused by the Mannlicher rifle bullet, and that the injuries generally were less dangerous to life. A very favorable account of the character of the wounds caused by the Lee-Metford bullet had been received from Surgeon Burden, who was present at three actions during the Chitral expedition. He reported that, so far as he had seen or heard from others, the wounds through the soft tissues at both short and long ranges were clean and incised, with very little or no bruising, and that they quickly healed. Through the bones clean punched-out holes were made, with little splintering, and he said in no case was their any explosive action. The damage caused by the large-bore bullets of the enemy was much more severe. During the French war, Chassepôt bullet wounds were often healed without suppuration. It might be taken for granted that the number of wounded in proportion to the numbers engaged and actually under fire would be greater than before, the supply of ammunition would be larger, the facility for its discharge greater, and smokeless powder would increase accuracy of aim. He thought they were justified in believing, although there was high authority for a contrary opinion, that the next great war would be more destructive to human life, and that the number of injuries,

and in many cases the severity of the injury, would be largely increased. But very many cases would remain less severe in character, more capable of successful treatment, and less likely to entail future disablement, while improved sanitation and antiseptic methods would enormously increase the proportion of recoveries. It was the unceasing effort of modern surgery to provide antiseptic protection in an effective form in time of war. The medical organization during our last war in Egypt was so complete in this respect that not a single case of infective wound disease occurred during the whole campaign. As a temporary dressing some form of antiseptic occlusion would prove most generally applicable. The small wounds of entrance and exit rendered this plan comparatively easy of application, and the chances of septic infection would be diminished by the less frequent necessity for probing or searching for a lodged projectile. If only asepticity could be insured, they might expect a large measure of success to follow the treatment of wounds of the soft parts, many forms of fracture, notably also wounds of the joints, and very especially wounds of the lungs.—*The Army and Navy Gazette.*

EXPENDITURE OF AMMUNITION IN CHITRAL CAMPAIGN.

Detailed returns of the expenditure of ammunition during some of the actions are interesting:—

Malakand Pass.

April 3:	Men.	Rounds.	Average.
Bedfordshire Regiment	795	1,600	2.01
1st King's Royal Rifles	773	1,455	1.88
37th Dogras	600	400	0.66
Total	2,168	3,455	1.51

Khar.

April 4:			
Bedfordshire Regiment	795	6,100	7.76
1st King's Royal Rifles	765	585	0.76
37th Dogras	540	12,280	22.74
15th Sikhs	722	5,950	8.24
Total	2,822	24,915	8.82

Panjkora.

April 13 and 14:			
King's Own Scottish Borderers	687	9,465	13.77
Gordon Highlanders	700	10,422	14.88
4th Sikhs	513	4,792	9.34
Guides' Infantry	632	24,560	38.86
25th Punjab Infantry	10	48	4.80
Total	2,542	49,287	19.38

Regarding the part taken by the first brigade in the actions of April 3 and 4, Gen. Kinloch says: "The fire discipline was excellent. To the best of my belief there was no wild firing on the part of any of the regiments. On April 4 the Bedfordshire Regiment and the King's Royal Rifles were only slightly engaged, but their fire was very effective and under perfect

control. The 37th Dogras and one company of the 15th Sikhs were in advance of the main body of the brigade, and their expenditure of ammunition was, of course, greater than that of other regiments."

The fighting on and beyond the Panjkora River will always be memorable on account of the gallantry and steadiness of the Guide's infantry when retiring before an enemy greatly outnumbering them. The fire discipline on this occasion was admirable, and the expenditure of rounds per man was certainly not excessive, as there was every temptation to indulge in rapid firing. It will be noted that the troops on the left bank of the river, who covered the final withdrawal of the Guides to their camp on the right bank fired over 24,000 rounds. This was, we believe, expended by volleys, mostly at long ranges. The fire, therefore, must have been controlled throughout. The enemy's loss was put at 500 or 600 killed outright, which implies a very large number of wounded. The expenditure of nearly 50,000 rounds, not counting what the Maxims fired, shows that it still takes pounds of lead to kill a man.—*Army and Navy Gazette.*

BUFFINGTON-CROZIER DISAPPEARING CARRIAGE: TEST.

"A test of the Buffington-Crozier disappearing carriage for a 10-inch rifle was made in the presence of the officials trying the pneumatic gun at Sandy Hook this week, with the Crozier wire-wound B. L., 240 lbs. of Dupont brown powder, and projectiles of 575 lbs. each. The muzzle velocity was about 1950 feet per second, and the pressure 43,000 lbs. per square inch. The gun was fired to seaward at an elevation of 10 degrees. Twelve men did all the work of transporting powder, loading and firing the gun, and the 10 rounds were fired in 14 minutes 42 seconds."—*Army and Navy Journal,* August.

RUSSIAN "MAGNETIC" OR SECRET-PROCESS ARMOR-PIERCING SHELL.

The design of this shell and the process of manufacture are strictly guarded secrets. It is supposed that a cap of soft iron or steel is electrically soldered or welded to the point of the projectile. The exact shape of the cap is unknown, but it is thought to be comparatively thin (about 0.5 inch) and of the same general shape as the point of the ogival. As in the case of all "secrets," the observers (at the recent trials) were probably intentionally misled by the Russian authorities, whose sole object was doubtless to create as strong an impression of superiority as possible. The tests took place at the Okhta proving grounds, near St. Petersburg, and a number of foreign officers and representatives were present by invitation, but the projectiles were carefully concealed from their view. The plates fired against were three in number, two of which were 8 feet square and 6 inches thick, and the other a curved plate 8 feet square and 10 inches thick. All three were Harveyed. The 10-inch and one 6-inch plate were made by Brown and the other 6-inch by Cammell. Each of the 6-inch plates were attacked by four "magnetic" shells, the first fired normally to the plate, the second at an angle of 15 degrees, the third at an angle of 20 degrees, and the fourth at an angle of 25 degrees. The first three shells passed through the Brown plate, but the fourth was broken up, though it got through. The normal

shot at the Cammell plate went through uninjured; the one striking at 15 degrees got through, but was broken up; the one at 20 degrees only penetrated about 3.3 inches before breaking up, and the last shot at 25 degrees gave about the same result. The gun used was a 45-calibre 6-inch. The weight of the ordinary projectile was 90 pounds, and of the shell with the cap about 93. The velocities used against the 6-inch plates were about 1850 f. s.; against the 10-inch, 2350 for the "magnetic," and 2400 for the ordinary shell. The difference in weight made the energies practically equal. No cracking of the Cammell plate was caused by the oblique shots, though being unsupported latterly, there was some tearing of the metal. This plate contained no nickel or other alloys. A couple of Holtzer shells without caps were also fired at the plates, one normally, the other obliquely. The normal shells got through the plates, but the oblique ones failed to do so. The 10-inch curved plate was pierced by the "magnetic" shells when the angle did not exceed 8 degrees or 10 degrees from the normal, but the ordinary Holtzer projectiles failed to get through. After receiving seven shots this plate was still free from cracks.—*Lieut. Van Duzer, U. S. N.* (*United Service*).

CANNONITE.

This is made by the War and Sporting Smokeless Powder Syndicate, at Trimley, near Felixstowe, England. It is a nitro-cellulose powder, and gun-cotton is the principal ingredient. This is mixed with solvents which leave it in a black plastic mass. It is then forced through perforated plates, the holes differing in size according to the intended use. The strings or threads are dried and broken up in a granulating press. A sifting machine then removes the dust and all unduly large or small particles. The grains are then finished in a revolving glazing barrel.

PROGRESSITE.

"Progressite contains but two constituents, nitrate of ammonium and hydrochloride of aniline, the proportions being 94 per cent. of the first and 6 per cent. of the second. The process of manufacture is extremely simple and cheap, the two ingredients being combined chemically by their common solvent, water. The manufactured explosive is perfectly homogeneous, and may contain a considerable percentage of water without the nitrate being affected physically thereby. This constitutes an important advance in the class of explosives under consideration. Another improvement is that it is less hydroscopic than others of its class. Eighty-eight hundredths pound of this explosive has been fired as a blown out shot without any stemming whatever, in the presence of inflammable coal-dust or gas mixture, and no evil resulted."—*Arms and Explosives.*

NEW EXPLOSIVE.

According to the *Echo des Mines*, a new explosive has been accidentally discovered in an unexpected quarter by M. Rossel, a French chemist, who found that a mixture of aluminum filings and sodium dioxide took fire with explosive violence when in contact with a little moisture. The preparation of the explosives is very dangerous, as, when it takes fire, fiercely-burning

particles are projected in all directions, the heat being great enough to fuse copper wire.

EXPLOSIVE FORCE OF CERTAIN EXPLOSIVES.

According to experiments conducted by the Board of Ordnance and Fortification, the explosives tested take rank in the following order as regards explosive force:

Perunite B	17.57
" C	15.61
" D	13.66
Explosive gelatin	10.00
Rackarock	9.36
Emmensite	5.49
Gun-cotton	3.16
United States rifle powder	1.72

This refers to blasting effect chiefly. Americanite is reported unfit for use in shells and, together with rackarock, to be unsafe under some other conditions. It was demonstrated that wet gun-cotton and emmensite can be safely used as charges for 12-inch mortar shells. This latter is not a very startling discovery. What we want now is an investigator who will supply a safe and efficient fuse for high explosive shell.—*Lieut. Van Duzer, U. S. N.* (*United Service*).

PNEUMATIC GUNS.

Tests at Sandy Hook. A group or battery of these guns, consisting of one 8-inch and two 15-inch, was mounted at Sandy Hook last summer and tested during the month of August. The gun-carriages are central pivot and admit of train through 360° and of elevation to 35°. They can be trained and elevated by pneumatic, hydraulic, or electric power, and, if necessary, by hand. The air-compressors, to pass the government test, were required to be capable of giving the requisite number of cubic feet per hour, at 1000 pounds pressure, for the maximum rate of fire of the guns and a proportionate volume at 2000 pounds pressure. The loading apparatus was expected to be of such a character that it would permit of a rate of firing of at least once in three minutes for the 15-inch guns and a projectile charged with 500 pounds of explosive, and twice that rate speed for the same gun and a projectile carrying 100 pounds of explosive. The contract with the company further stipulated that the 8-inch gun must be capable of projecting shell charged with 100 pounds of explosive to all ranges from 100 to 2600 yards, and shell charged with 50 pounds to all ranges from 100 to 3200 yards. Each 15-inch gun was to be capable of projecting charges of 500, 250, 100, and 50 pounds of explosive to ranges between 100 yards and 3000, 3550, 4500, and 5500 yards respectively. On the trial for range these ranges were generally considerably exceeded. The greatest range obtained with the 15-inch gun and a 50-pound charge was about 6000 yards.

The trials for speed of operation took place August 23, 1894. The general features of the carriages used are given above, but the following may be added. A circular railway extends around each gun and the projectiles are loaded from a car which travels on this railway. This arrangement per-

mits the gun to be loaded in any position of train, but it must be at a fixed position as regards elevation. This elevation, called the loading angle, is 7 degrees above the horizontal. The elevation used throughout the firing was 15 degrees. The gun had therefore to be raised and lowered 8 degrees for each round.

The first group consisted of 5 plugs, each weighing 445 pounds, being the same weight as the 8-inch sub-calibre projectile (15-inch gun) containing 100 pounds of explosive gelatin. Starting with the gun open at the loading position and the first plug in the loading car, the first round was fired in 52 seconds. The group of 5 shots was fired in 8 minutes 45 seconds. The contract requirements for this group were that the first shot should be fired in 1 minute 30 seconds, and all in 10 minutes.

Ten rounds were fired in the second group. Each plug weighed 556 pounds, being of the same weight as the 10-inch sub-calibre projectile (15-inch gun) containing 200 pounds of explosive gelatin. Starting as before, the first round was fired in 39 seconds, and the ten rounds in 14 minutes 40 seconds. The contract requirements for this group were that the first shot should be fired in 2 minutes, and all in 27 minutes.

Ten rounds, also, were fired in the third group. The plugs weighed 1160 pounds each, and each represented a 15-inch full calibre projectile containing a charge of 500 pounds of explosive gelatin. With the same conditions of starting as before the first round was fired in 46 seconds, and the group of 10 shots in 15 minutes 36 seconds. The contract requirements for this were that the first round should be fired in 3 minutes and the group in 40 minutes.

Nine fuses were used before the tests began and twenty-one during the continuance. Only one failed to act. The contract requirements in this respect were that seventy-five per cent. should act satisfactorily. A further test for accuracy took place a few days later, but no detailed report of the results has come to hand.

TRIAL OF 6-INC HARVEYED PLATES IN RUSSIA, WITH "MAGNETIC" AND ORDINARY SHELL.

"The contest between English armor-plates and Russian guns and shells was renewed on October 14 at Okhta, near St. Petersburg. Two 6-inch Harveyed plates by Messrs. John Brown & Co. and Messrs. Vickers, respectively, were attacked by the 45-calibre 6-inch Obonkoft guns. The conditions, so far, were practically much the same as in July last, when plates by Messrs. Brown & Co. and Messrs. Cammell, of Sheffield, were fired at, and the result appears to leave the last-mentioned firm still to the front as far as plates hardened by the Harvey process are concerned. The plate from Messrs. John Brown on this occasion was 6 feet square; the one from Messrs. Vickers was 8 feet square. The former had one corner and a strip all around left unhardened. The object of this novelty is to prove that the Harvey process can be applied to armor-plates in such a manner as to leave softer spaces at will for the drilling of holes for torpedo-net booms, etc., after the fixing of the armor to the sides of the ship, and this without affecting the quality of the plates. [This leaving of soft strips and

patches in Harveyed plates may be a *novelty* in England, but it has been regular practice in the United States for *some years*, almost from the very beginning of the manufacture of Harveyed armor; and it no more needs "proof" of practicability than the fact that 2 and 2 make 4. The areas left soft in recent plates are much smaller and fewer in number than those in former plates, as the electric process of softening has, in most cases, rendered larger patches unnecessary.—L. S. V. D.] Two rounds were fired at each plate in the normal position with a striking velocity of 1889 f. s., the first with ordinary Holtzer shells, and the second with Holtzer shells improved by the secret "magnetic" appliances of Admiral Makaroff, both kinds being manufactured at the Putilof Works. All the shots passed through the plates. The plate from Messrs. Brown cracked considerably at the first round; the second shot produced no cracks. The first shell fired at Messrs. Vickers' plate passed through it and the backing unharmed; the other was broken up in or behind the backing. Messrs. Vickers' plate was then turned to an angle of 15°, and with the same velocity one round was fired at it with the "magnetic" shell, which broke up in the backing, perforating and cracking the plate severely. The experiments will be continued."—*Engineering*, London.

U. S. FIELD GUN.

The German gun fires a projectile 4½ lbs. heavier than ours. The Spanish 7.85 c. m. gun of the Sotomayor system seems somewhat superior to ours. The comparison given is based on shrapnel fire, which is, par excellence, the standard fire; the fire which will be used on the battle-fields of the future; no other fire can approach it in man-killing power at long ranges.

Sotomayor: Calibre, 3.09 in.; weight of gun, 770 lbs.; weight of projectile, 14.33 lbs.; bullets in shrapnel, 231; muzzle velocity, 1509 ft. seconds; muzzle energy, 226 ft. tons; range at which final velocity will be 600 ft. seconds, 6430 yards; rounds in limber chest, 36; weight behind horses with piece limbered up, 3608 lbs.

U. S. Field Gun: Calibre, 3.20 in.; weight of gun, 829 lbs.; weight of projectile, 13.5 lbs.; bullets in shrapnel, 170; muzzle velocity, 1700 ft. seconds; muzzle energy, 271 ft. tons; range at which final velocity will be 600 ft. seconds, 5930 yards; rounds in limber chest, 42; weight behind horses with piece limbered up, 3789 lbs.

It is to be noted that the smaller calibre and lighter Sotomayor gun gives decidedly better shrapnel effects than our larger calibre and heavier gun. The Spanish gun fires a shrapnel which contains more than 30 per cent. more bullets than the American gun, and this projectile carries these bullets with a man-killing velocity up to a range 500 yards greater than that at which our gun gives the same remaining velocity to its projectile. This is done with a less strain upon the carriage by 55 ft. tons than that caused by the recoil of the United States gun, and with less weight behind the horses by about 200 lbs. Our gun carries 6 more projectiles in the limber than the Sotomayor gun, but adding this number to the load of the Spanish limber, the weight behind the horses would still be 90 lbs. less in the Sotomayor system.—*Lieut. Shipton, Army and Navy Journal.*

Comment and Criticism.

I.

"An Antiquated Artillery Organization."

General H. J. Hunt, late Chief of Artillery, Army of the Potomac.

IT may prove of interest to our readers to note the views of General Hunt regarding the Artillery Reserve, Army of the Potomac, given by him soon after this force was broken up, May 16, 1864, and published in Volume XXXVI. of the Official Records.

"The Reserve Artillery of this army was organized in the autumn and winter of 1861 and 1862, and the experience of many campaigns has proved its great value. Its records prove that on the field it has done its full share of fighting, and borne its due share of the losses of the artillery, while it has rendered other and fully as important services. At many of our principal battles, notably Malvern Hill and Antietam, its ammunition train supplied the batteries of the divisions, many of which would otherwise have been rendered useless. Whenever, from the character of the ground or from other circumstances, the ordinary amount of artillery attached to the troops proved insufficient, it has supplied the deficiency. Its batteries in all our great battles have always gone into action at critical moments, and almost invariably every gun has been called for and employed. Especially was this the case at Malvern, Antietam, Fredericksburg and Gettysburg. It has also been of great value in another way. Batteries in the corps losing their efficiency either from want of men or material, the incompetency of their officers or casualties of battle, have at once been replaced from the reserve, thus keeping the army corps fully effective and giving the broken-down batteries the necessary opportunity and supervision to restore them. In this way the Reserve Artillery has kept up the efficiency of the whole army. I have considered this notice of the Reserve Artillery as necessary under the circumstances in order to guard against the inference which might be drawn from the order to break it up. The inconveniences that have since been felt from the want of it, the order to return the guns to the batteries, now being executed, and the fact that it has been found necessary to keep up the reality, without the proper organization of the Reserve, in order to insure supplies of ammunition to the army and to furnish a place for surplus unattached and disabled batteries, has clearly vindicated the principle of the necessity of such an organization in a large army."

II.

"Discipline."

Captain C. J. Crane, 24th U. S. Infantry.

THIS is a subject that we all feel more or less conversant with; nothing is of more importance to the army. As the measure of our discipline rises and falls, so varies the efficiency of our army as a fighting force, and it is our aim and endeavor to fix and hold such efficiency as near the top notch as possible.

The importance of discipline is well explained by Capt. Ellis and Lieut. Steele in their articles which undoubtedly merit the high distinction awarded them. The article of the first named officer seemed while I was reading it to cover the point, and yet

afterwards I felt that Capt. Ellis had not told me just exactly how to get it, that is, —the state of discipline that I wish in my company.

Leaving out the post exchange, the advantages of which I consider still an open question, his suggestions and recommendations are good, very good; and more than a week had elapsed after reading them, before I discovered wherein he had failed to satisfy me, in his explanations of the various requisites necessary to improve our discipline and maintain it.

On the first page of the JOURNAL we find a careful explanation of the difference between discipline and drill, so that we know that they are not the same. By his entire omission of the importance of drill in inculcating true discipline he leaves the apparent inference that he did not consider it worthy of mention, unlike a company amusement room which he appreciates very highly, and justly so.

He also dismisses the question of food in the belief that it has no bearing on the point at issue, his action being based upon the quantity and quality of the ration uncooked.

The soldier's ration is sufficient, but that there are many ways of preparing it for the table we are continually reminded, and in enumerating the many things I would like to have in my company to help me to retain good discipline after I had obtained it, a good, reliable, honest company cook will always rank high, higher than post exchange or amusement room. However, that is only a question of opinion, and many experienced officers may think differently.

But with regard to drill, and its great importance in promoting and maintaining discipline in our army, it is hardly probable that Capt. Ellis's ideas differ materially from my own.

Perhaps it was considered that the words "promote" and "maintain" in the title of the essay assumed the existence of the discipline that we now have, and that drill had lots to do with its creation. If so, why was it not also taken for granted that we have exchanges, courts-martial, amusement rooms, books, etc.? It surely could not have been taken for granted that we would need no more drill in the effort to maintain a high standard of discipline after once gaining it.

In our work to improve anything we usually begin at the beginning and improve all along the line; otherwise certain imperfections would always remain.

Then in the effort to promote our discipline, if drill will materially influence its quantity and quality from the very beginning to the end, the importance of our auxiliary should not be overlooked.

And if, after getting the state of our discipline as near perfection as we can hope to do, the assistance of drill will still be of advantage in maintaining the high standard obtained, simple justice requires that due credit be given where it belongs.

For us in the army I believe that Capt. Wilhelm's definition of discipline—"the habit of obedience,"—needs only the addition—"to military authority."

I believe in lots of obedience, and so do we all who have the good of the army at heart. How is the beginning of discipline made? How is the habit of obedience first acquired in our service, and on what do we depend in our first efforts to teach the recruit that he is to obey implicitly the orders of his military superiors?

What can it be if not drill; and no recruit these days ever gets enough of it; yet during the weeks of careful drill first given him is laid the real foundation of all discipline, the habit of obedience. This habit is made second nature by the control and authority exercised hundreds of times at each day's drill.

And on nothing do we depend so much to retain our hold upon the soldier after he ceases to be a recruit.

Suppose that to-morrow war should be declared against some great nation. Leav-

ing out of consideration the 3 to 6 hours' daily drill that would obtain in every great camp of volunteers, would we not immediately increase the quantity and quality of our drills and military exercises generally? And what would be our object in doing so if not to increase our discipline, our efficiency as a fighting force?

It is perfectly natural for the recruit to be so influenced by having to obey the hundreds of commands that he hears at drill, that he really forms then and there the habit of obedience. And knowing that during our drills (military exercises) we can observe all our men at once and can compel obedience to the numerous commands used on the drill ground, it is just as natural for us to return to the drills every spring in order to straighten out our companies, and renew in our men that habit of obedience without which there is no discipline.

But even the truest truth seems stronger when uttered by some one of recognized authority, and for that reason I will call to my assistance the aid which hardly seems necessary to prove my proposition.

In Lieut. Reichmann's translation on "Infantry Tactics," in the July JOURNAL we find the following:

"The individual training of the infantryman continues to be regarded in Germany as the basis of all tactical training and if it is objected to here and there, that in this individual training too much value is placed on drill and parade and that 'German pedantry' is too predominant, it may be stated in reply, that the purely mechanical part of the man's training must receive attention, not as the ultimate object, but as a means for inculcating discipline and military habit." Major Maude, an English officer, whose reputation is well known, has expressed exactly my own ideas, as follows:

"The object in view in drilling men is not merely to insure the execution of certain formal movements on parade under favorable conditions, but to give them true discipline, *i. e.*, the spirit to face heavy losses without flinching—the one thing in fact, which constitutes the superiority of a body of soldiers over an armed rabble.

"There is, in fact, a close analogy between drill and mesmerism; in both cases the patients resign their wills into the hands of the operator, and in both cases, ultimately, the will of the operator or commander becomes stronger than the natural disinclination of the subjects to do what is required of them.

"It is this that renders s eady drill all important, as it enables us to overcome the natural instinct of self-preservation, and makes it easier for men to obey the will of another than to make up their minds to run away.

"The necessity of such drill is greater now, perhaps, than at any former time; for the mental strain occasioned by a breech-loading fire is far heavier and of longer duration than that produced by the muzzle loader."

To make assurance doubly sure, foreign writers have told us that in 1870 the Germans resorted to the execution of simple drill movements on the battle-field to steady their men under fire when they had shown signs of unsteadiness.

It is my firm belief that the American soldier has always been most in need of that particular phase of discipline which can be reached by only one road, which is to carry our drill nearer perfection.

In giving numerical values to the different aids to good discipline I would rank lots of intelligent drill above all others combined, and would give it a value of at least 55 out of 100.

Referring to Capt. Ellis's estimate of drill, that it does not affect the moral part of our nature, I prefer to side with Major Maude, whose ideas on the intimate connection between drill and discipline I have quoted.

* * *

Lieut. Steele also omitted to include drill in his list of desirable aids to discipline.

Some of his recommendations are very good. I like the one relative to giving young officers plenty to do when they first join, and thus prevent their falling into bad habits, or at least, into lazy ones. Other suggestions that he made do not seem to me to be founded on a real correct idea as to what should constitute good discipline. He evidently believes we should have no caste in the army, that there should be something more like equality between officers and enlisted men.

This caste or broad dividing line between those commissioned and those without it, is due only to their relative positions officially, and continues only while both are in the service. As soon as the enlisted man returns to civil life he resumes the place, socially, which he held previous to his joining the army, and then there is no more of the former gulf between his former officer and himself. That Lieut. Steele should believe that good discipline can exist in an army at the same time with no caste, no broad dividing line between the enlisted man and his officer, surprises me very much.

In the beginning of the war 1861–1865, the volunteer private addressed his captain as "Bob," and his major as "Bill." Discipline, real discipline, was at a very low ebb with those volunteers then; but did that social intercourse remain on the same footing till the end of the war?

As the war progressed, discipline improved, the fighting efficiency of each organization improved, and at the same time that social intercourse between officers and enlisted men steadily diminished, and finally the distinction between the two classes bade fair soon to resemble very much that caste which Lieut. Steele is so opposed to, but which is absolutely essential to good discipline, and is most distinct in those armies that have the best discipline.

We have seen much of the poor results which travel along with the non-commissioned officer who allows equal familiarity from his inferiors, and we have seen so many such non-commissioned officers, that the general cry is for one who will not allow it; we all want him.

Lieut. Steele has a wrong idea about the company orderly room.

That room is the *Captain's* office, he is the man who should be most at home there, and I can see no reason for any sociabi ity on his part any more there than on other occasions.

When his captain told "Private Jones," "that will do," and took no further official notice of his insubordinate speech, "Private Jones" was lucky.

There are other suggestions in the same general line with those quoted, and altogether, Lieut. Steele's recommendations, if carried out in any regiment, might create and maintain his idea of "American discipline," but that kind of discipline is what I do not wish in my company.

III.

"The Military Academy and the Education of Officers."

Captain S. E. Stuart, U. S. Ordnance Department.

LIEUT. HUBBARD has, I think, performed a valuable service to the army and to West Point by the publication of his article on the course at the Military Academy. Although he may not have gained much ground directly by "bucking the centre of the line" of that venerable but still virile institution, and was tackled early and hard, still he has, at least, put the ball in play, and, indeed, there will be many to hold that he is not yet "downed," at any rate, it is not, perhaps, too much to say that he had the good-will of a majority of the spectators. There is undoubtedly a strong sentiment in the army at large that the course at West Point is "too mathematical." The existence of such a feeling is to be regretted, and brought

to an end if possible, and a general discussion of the subject will be valuable if it shall succeed in bringing the service and the institution closer to each other and to the truth, by bringing about a better mutual understanding and correcting the errors of one or both. Hence the contribution of my mite.

But when officers from the service at large agree in criticising the course at the Academy as "too mathematical," to use the ordinary expression, they do not necessarily agree in reality. One may think the course too mathematical because the mathematics and allied subjects are too abstrusely taught; another because it contains too much mathematics, absolutely, for all or a portion of the cadets who graduate; and a third because it contains too large a proportion of mathematics for the object to be attained. These reasons though expressed in the same phrase, are really sufficiently distinct to admit of separate consideration and, largely, of separate correction. I will take them up in the order named.

No one will maintain that the system of instruction in vogue 20 years ago, about the time of the beginning of the great change in the personnel of the Academic Board, was up to modern practice in all respects. Although perhaps the best possible course for its special purpose at the time it was established, many years before, the great advance that had taken place in the world at large, both in the substance and the methods of education, had pointed the way to improvements; and this advance still goes rapidly on, continually making possible, and so necessary, changes for the better which the Academy must recognize and adopt if it is to perform its functions in the fullest degree. But much has been done in the direction of this movement, how much one hardly realizes until he compares the course of to-day with that of twenty years ago. About that time a new course in engineering was substituted for the old, and it has since been again renewed, and the course in drawing was radically reconstructed. Then came a great change in the manner of instruction of the course in mathematics, amounting to a new course, and a complete revolution in the course in chemistry, etc. The course in philosophy has also been entirely changed, and so, too, has the course in ordnance and gunnery. And all these changes in the courses pertaining to mathematics and the natural sciences have been distinct advances away from the old abstruse system of instruction, by way of a plainer statement of the principles and more connection of them with their applications by problems, etc., or by the introduction of experimental work, or by both combined. Indeed, whoever, who knew the course fifteen or twenty years ago, becomes familair with it now, cannot fail to recognize the great improvement that has been made since then in the methods and character of the instruction given. And still further, and marked, improvement is likely to result from the occupancy of the new Academic Building, which provides opportunities for laboratory or experimental work that have hitherto been practically unattainable. We may, at least, all find satisfaction in observing the present trend and in knowing that the need of more practical or experimental work is recognized by the Academic Board. Nay, we may even rejoice that, though we may suffer from some of the ills of conservatism, they prove that it exists and dispel any possible fear that the splendid system of education which has made the name of West Point famous throughout the civilized world will not be lightly destroyed, or modified by other than the slow but wholesome process of growth.

It is, in my opinion, true that, in some of the more abstruse courses, at least, too much is attempted to be taught to the lower portions of the class. The study of the less able cadets must partake too much of the nature of cramming in order to cover the ground, and for them the course is overcrowded. I think the difference between the attainment required of the first section and the "immortals" should be more a difference in quantity and less in quality than is the case now. If we say that an attain-

ment of two-thirds of the amount possible to the ablest men constitutes bare proficiency, let the difference of one-third consist mostly in the amount required to be studied rather than mostly in the thoroughness of understanding of what is studied. Let the less important parts of each course be cut out, more for each succeeding section, until the "immortals" have say two-thirds as much to learn as the first section, and then let a mark of 2.5 or 2.7, "good," be required for proficiency. A long step in this direction would, I think, be conducive to real benefit to the lower men, and would remove the principal objection to the course felt by a numerous body of critics. This method would be far better than a formal division of the class, to which very serious objections exist. By it the elemental principles would be learned by all, while the more capable men would pursue the subject, in proportion to their abilities, into its ramifications or more abstruse portions.

I do not think that the course is overcrowded for the first section, or that it would be so for the rest of the class if suitable reductions of the kind just mentioned were made; provided, that for all the text-books and methods of instruction be well adapted to their purpose. The method of instruction is particularly important for the lower men of the class. Perhaps I may be pardoned if I occupy a little space in setting forth what I think to be the best method, for the mathematical and natural sciences, under the conditions that prevail at West Point. I will take an illustration from instruction in mechanics, with which I am most familiar.

Suppose the instructor writes on the board these two equations:

$$F=M\frac{d^2 s}{dt^2} \text{ and } C=np,$$

and tells the cadets that the first means that F, the intensity of the force, equals the product of M, the mass, by the acceleration, and the second that C the cost of a piece of cloth equals the product of the number of yards, n, by the price, p, per yard. The majority of the class beginning the study of mechanics will look on these two equations in quite different ways. It would not naturally occur to any of them to regard the second as an algebraic expression. The mind would grasp the idea conveyed, and take as little note of the method of expression, as it does in reading the morning paper. But the first would be regarded primarily as an equation, a mathematical expression of a, to them, abstract relation, and the first concern would be as to how many forms like

$$\frac{F}{M}=\frac{d^2 s}{dt^2}$$

etc., the equation could be made to take by the instructor in questions after recitation. Now, it is this unobservant or unreflecting attitude of the mind of the average cadet (and of all students, in fact), this failure to look for the substance instead of regarding principally the form of the matter studied, that the method of instruction should correct. And once corrected, once the student is made to go straight to the idea, regarding the equation merely as the vehicle of the idea, not as the idea itself, then mechanics becomes easy and interesting, and then can the mind reap the benefit of the study. I think that a course of individual experimentation in the study and verification of this and other fundamental formulas of mechanics, particularly at the outset of the course, would go far to remedy this evil, and would make the remainder of the course so much more easily comprehended as to be worth the expenditure of considerable time on it, considered only as a time-saver. To put it in more general terms, I think the method of instruction in the branches mentioned should be based on mathematical deduction, as at present, but accompanied to a greater extent than has been general hitherto by individual experimental reference of the deduction to the actual phenomenon, in order to show the student the true function of the mathematical work, to enable him to firmly grasp the principles of which it treats and to connect them with

their applications in the material world. In this way the value of the course would be increased both in its training effect and the acquisition of information for future use.

We now come to the third cause of complaint, that the proportion of mathematical studies is too great. I confess that, were I convinced that the present conditions would continue, I should be of an "uncertain faith" in respect to this matter. The study of mathematics is of such great value for the development of the reasoning faculties and the power to distinguish the unchanging principle from its varying applications; and the experimental study of the natural sciences is so efficacious in developing ability to observe and draw conclusions from observation, in short, to correctly gauge one's surroundings; and liberal or literary culture increases so greatly one's power as a member of society, to influence it and to divine its constitution, trend, and needs, that it is difficult to deliberately decide to omit any one of these branches of education from the curriculum. But let us not make the mistake of the child that, unable to hold two balls at the same time, drops the one already in possession to grasp after another. The Academy cannot do more than it is doing now. As things are at present, nothing can be added of the latter branches of education without taking an equivalent amount from the former. In this connection it is well to remember that experimental and inductive work, in order to have any decided educational value as such, must occupy a good deal of time; and time is what the Academy most lacks. Experimentation is a slow process, in which much time must be lost in details of little value in general educational effect. And as for liberal culture, it is the branch of education that can best be spared by the soldier, at least from the Government's point of view; and, unlike other colleges, it is not what is most valuable individually to the student, but what is most useful to the Government that should rightfully prevail at West Point.

If the standard of admission can be raised opportunity may be gained for the introduction of these needed elements. Lieut. Willcox has recently shown how the principal reason that has hitherto operated to maintain the low standard has practically ceased to exist, and introduced an element of hope where all seemed despair. If there be any chance of obtaining this just and needed relief would it not be better to refuse to part with any of the present excellencies of the course, and standing on that ground, demand a higher standard of admission for the purpose of gaining time for a modern study of the natural sciences and some literary culture, than to adopt a course that would be excellent in none of these branches, and trust to fate to raise the standard of admission and restore the old excellence? All the criticisms on the course, or very nearly all, made by Boards of Visitors and others likely to influence the powers that be may be answered by a reference to the low standard of admission, and it seems to me that we stand just as we are, in the best position tactically for waging a battle for a higher standard, and that we should not leave it till the battle be definitely lost or won.

But I think something could be done to relieve the pressure at West Point by bringing the service schools and it into correlation with each other and transferring some portions of its technical course to them. And this brings us to the subject of the unity of our system of military education and the method proposed by Lieut. Hubbard for securing it.

It seems axiomatic that a complete system of military education, consisting of successive schools, can only be perfectly adjusted to its object by careful correlation of the different parts; and also that an effective correlation can be accomplished and unity established throughout the system on the plans devised by a single body, *suitably composed*. But "there's the rub." If it be not suitably composed the last state of that system may be worse than the first, inasmuch as even the efficiency of the separate parts may be destroyed.

The danger is too great if this power be put in the hands of those not imbued with

the spirit of the service and the traditions of West Point, or who lacking experience in the particular subject, should evolve from an inner consciousness a system which they would promulgate, leaving to others the task of putting it into practical application. And when the parts of the system are separately good, any change should be gradual and the result of constantly tested advances. If a commission or board is ever created for this purpose, let it be mainly composed of the Academic Board and the staff of the service schools. Suppose it to be composed of, say, four members of the Academic Board, one member of the staff of the Engineer School, one of the staff of the Artillery School, and two of the staff of the Infantry and Cavalry School, all elected by their respective bodies, with the General Commanding the Army, as president. I think such a commission could be trusted to proceed with caution and to do much toward the unification of our system of military education without destroying what of good it already possesses.

Many, perhaps most, of our officers, whatever their branch of the service, wou'd in the event of war be called on to take volunteer commands, principally of infantry but some of cavalry. Hence I think all our officers should receive a good education in the infantry branch and some special instruction in the cavalry. Do this and let all cadets be assigned at graduation, perhaps as brevet 2d lieutenants, to the cavalry and infantry, and serve there till they go to the service school, invariably at the end of one or two years, transferring from one branch to the other so as to serve half the time in each. Then let all go to the infantry and cavalry school and take a course suitable to all arms and a fair course in infantry and cavalry. The final assignments should then be made, and each should then pursue in the school of his special arm a suitable technical course. Or let the artillery assignments go for a short time to their regiments, and then to the Artillery School. Whatever the officers of engineers and artillery might lose by this system as officers of their special corps, would be more than offset by their gain as officers of the army.

There is one other matter that I want to consider before closing, and that is the administration of, or rather, the instruction in, miltary discipline at West Point. This most important part of the instruction is shared in to a degree by all the departments, but it is specially intrusted to the Department of Tactics. That it is well done there is no question, but still I think there is room for improvement. There is in this department, I believe,—I should be glad to learn that it is not now so—a too prevalent spirit of—I will call it rivalry for want of a better term—towards the cadets; a spirit that prompts them to rejoice at having made a "hive," as having gotten ahead of "that man," instead of regretting that they have not been able to imbue him with a correct spirit of military discipline that would have prevented the commission of the offense. To report breaches of regulations is too much regarded as the principal function of the tactical officer, and the fewer such breaches that escape his notice the more efficient the officer. The spirit goes hand in hand with the impersonal and antagonism-creating method of the "skin-book." The basis of the system seems to be to force a cadet, willy-nilly, by an arbitrary system of punishments, into an outward compliance with discipline, rather than to induct him into an inward respect for it. Such a system is likely, and often is, followed by more than a relaxation, a positive rebound, when the cadet escapes from its power by graduation, and moreover, it is not calculated to produce the highest results at the Academy. There is a certain regrettable lack in the standard of discipline prevailing among the cadets. Most cadets perform military exercises in a "military" manner because it is "military" to do so; but how few respect their superior cadet officers, or obey the general Academic Regulations when there is no chance of detection in disobedience, because it is military to do so. Nor is any serious attempt made to instill this finer spirit into their minds.

The officers commanding cadet companies should be men of high personal character, ability, and possessed of a military spirit and bearing; and no one should be selected for this important post who has not all these qualifications in high degree. The very pick of the army should be taken. They should be considerably removed from the cadets by age, service and rank, and as far out of the sphere of rivalry with them as father with son. They should, I think, generally be captains, young enough to be active and military, or if a 1st lieutenant be desired, let him be one of long service; but length of service can hardly replace actual rank for the purpose desired. Then, having a suitable company commander, let him have an office in his company barracks, and there let him settle all minor infractions of discipline by personal interviews, awarding the demerits according to a fixed scale, as instructors in other departments award the marks that determine the standing. He could keep in close touch with his cadet officers and develop in them proper notions of the responsibilities and duties of their positions, and foster in all the cadets under his charge a correct and high military spirit. Such constant effort and example could not fail to leave on the characters of the cadets an indelible impress, one such as it might be the highest aim of any institution to have imparted to its graduates.

IV.

"Suggestions for the Improvement of the National Guard."

C. T. Jeffers (late) Inspector General South Dakota National Guard.

AT the present time a great deal is being written relative to the National Guard of the several States, and there are almost as many views as to what the status of the organization should be as there are writers.

Of course it is conceded by all who give the matter any serious thought, that the National Guard is a very valuable adjunct to the Regular Military Force of the United States, and after the experience of the past two years, it should not only be considered as a great aid to the military force but something that could not be dispensed with; in fact the organization is just as essential to the preservation of law and order as the Regular Army; and under these conditions would it not be suicidal to neglect to provide liberally for its maintenance; not only that but measures should be taken to encourage it, and to improve its condition in all that pertains to the duties that are liable to be required of it. Up to the present time this has been the most economical force that has ever existed in modern times. A writer has said, "The amount paid by both the State and Federal governments combined toward the support of the National Guard will average about 3% of the cost of an equal number of troops in the Regular Army, or an equal number of policemen in the city; and these guardsmen always stand ready at a moment's notice to assist efficiently either one in case of need." This being so, the National Guard is the poorest paid of any force, whose duty it is to stand between our republican institutions and destruction when threatened by lawlessness and anarchy, and to protect life and property. Companies reporting from forty to fifty drills for the year, with an average attendance of 50% of their membership shows that great interest is taken in these organizations by the members; such faithful service as this should be recognized, these drills are held in the evening and after working hours, and most of the time in armories where they are hampered for room, and the most important part of the drill, viz., the extended order, fire discipline, guard mounting, and the duties of the sentinel are neglected. In order to improve the discipline and create a status for the National Guard the following suggestions are offered for the consideration of those who are interested in this, "the reserve force of the army." The United States should take a more active part in its management than it

does at present. The Constitution of the United States provides that Congress shall have power to "provide for organizing, arming, and disciplining the militia." Now it seems quite reasonable, that under the Constitution, Congress has power to prescribe for the organization of the militia; and that body should at once exercise this authority, by enacting the necessary law to provide for a uniform organization, not only of the line but for the staff as well, with the view that if any or all of the National Guard should be called into the service there would be no friction in the work; it would be very easy to do this, and the staff which in many States is top-heavy would be reduced to a minimum, and irregularities which at present are a detriment to the service would be corrected. There should also be provisions made for out door drills; say one each month from May to October inclusive, of six hours each, six drills each year in which the extended order should be taught, and fire discipline practiced with cartridges, upon a properly constructed rifle range. Upon the certificate of the proper officer those who participated, should receive from the United States a reasonable amount for each day's service. By this method the men would receive valuable instruction in the most important part of military duty, and which could not be taught in the armories to any great extent. A detail of an army officer should also be provided for, to be present at one drill of each company each year, and as many more as is consistent with the view to instruct and to correct any misconstruction of the drill book, and also to report upon the proficiency of the company. In this way the men would not feel as though they were throwing away their time, which, under the present system, they would be, if these drills were held during working hours; and as a majority of the members of the National Guard are men who work for wages, six days taken from their time without any remuneration is a serious item of expense to them. By this means the United States would get the benefit of a force that was somewhat familiar with the duties that would be required of them, in case they were called into the field; while the men would get paid for their time, and as this service would be under the authority of the United States, and the men paid by the United States, discipline would be better enforced than if these exercises were voluntary and without compensation. The expense would be comparatively small, while the returns would be largely in favor of the United States in the matter of instructing men in the duties of the soldier.

V.

"'Right (or Left) Turn' of the Infantry Drill Regulations."

Captain R. M. Smith, N. U. C. C.

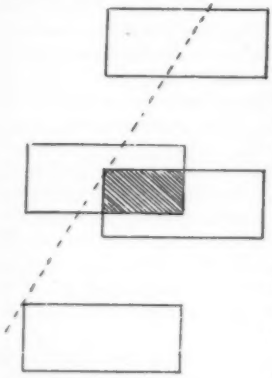
IN the May number of the JOURNAL Captain Kingman clearly demonstrates the impossibility of executing the above movement as prescribed.

Lieut. Ludlow (July number JOURNAL, page 186) says "In order to make the entire movement practicable it is only necessary to shorten the length of this step (meaning the short step) sufficiently to bring the degree of obliquity within practical limits" He explains the movement for the front rank and says "With a suitable short step—say 10 inches for quick time or 12 inches for double time—the rear rank men may 'conform to the movements of their file leaders' by following at facing distance when moving in quick time or at 36 inches when moving in double time." With that short step he finds that the angle at which the men will oblique will be 58° 38′, whether the movement be executed in quick time or in double time.

If a rear rank man moves in the trace of his file leader, it is evident that when he arrives on the line, his centre should be where the centre of his file leader was at the time of his arrival on the line.

If the men follow their file leaders at facing distance when moving in quick time

and at 36 inches when moving in double time, the distance from centre to centre of the ranks will equal the distance from the centre of a rear rank man who has not arrived on the line to the centre of his file leader.



But the lines of the ranks move only one-third as fast as the files who have not reached the line, therefore, each rear rank man, if he march in a straight line with the full step, will come on the line at a point too near the pivot flank. In fact, he would arrive on the line of the rear rank before his file leader arrived on the line of the front rank.

A glance at the figure, however, shows that it is impossible for the rear rank men to follow their file leaders at facing distance when obliquing at an angle of 58° 38′.

This movement cannot be executed as Lieut. Ludlow directs.

Capt. Kingman proposes a practicable movement.

In "A Technical Criticism" (July number, JOURNAL, page 101) Lieut. Brooks mentions a great objection to the turn as prescribed (assuming that it is a possible movement).

The turn as proposed by Capt. Kingman has the same objection, that is, it requires too much room.

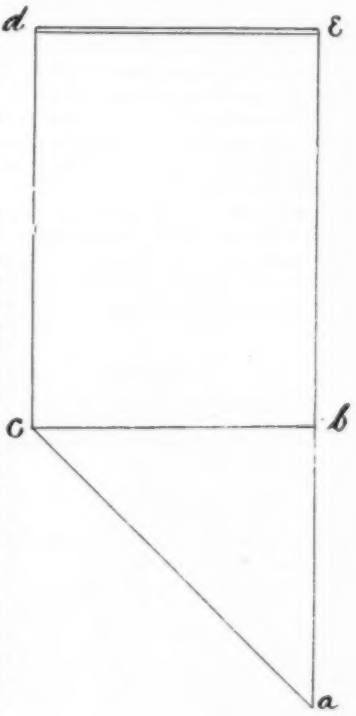
de represents position of company at completion of movement.

ab is position of company at beginning of movement.

acd represents the path of the file on the marching flank.

Referring to the figure, which shows the position of a company after the last file has arrived on the line, if it uses the turn proposed by Capt. Kingman, we see that had it executed the "turn and halt" and then moved forward with the full step, it would have been in the same position at the same time, as the file on the marching flank goes the same distance and moves with the same step and in the same cadence in either case. This naturally leads us to inquire why it would not be as well to use the "turn and halt" as to use the turn which Capt. Kingman proposes.

We find the statement in the Drill Regulations in the explanation of the "turn and halt" that "the rear rank men conform to the movements of their file leaders." They cannot follow their file



leaders at facing distance in executing "Company, Left" with arms, and the Regulations probably do not mean that a movement shall be executed in one way to the right and in another way to the left, so that construction must be abandoned.

If each man obliques at an angle of 45° from his place, each rear rank man will come on the line at a point too near the pivot flank, and the same is true if the rear rank men step into the places of their file leaders at the beginning of the movement before commencing to oblique. To make a change of front of 90° in which the line does not gain ground in the new direction, the rear rank men should march 28 inches beyond the line where their file leaders were at the beginning of the movement before commencing to oblique.

Being in line at a halt or marching: to change direction to the right, at the command march, the front rank man of the right file faces to the right and stands fast; the other front rank men oblique to the right at an angle of 45° and place themselves successively on the alignment established by the front rank man of the right file, taking the full step. The rear rank men (except the one on the right) take three steps of 19 inches each to the front, then march by the shortest line to their places.*

The men halt on the line without coming to the order; when the last file is in place, the command to move forward is given.

If there is a guide he moves as explained for the front rank man of the right file.

The rear rank man of the right file takes his place as soon as practicable. If marching in double time the three steps to the front taken by the rear rank men should be 25 inches each in length.

The movement is executed to the left in a similar manner, substituting "left" for "right" in the explanation and *vice versa*.

This movement will occupy no room in the new direction, which makes it desirable for reviews, etc. The other objection to the turn as proposed by Capt. Kingman is the one which he mentions, namely, that the men generally oblique too far before changing direction.

It is believed that this method will do away with that objection, as the line does not move forward until all the men are in their places. The movement will be an orderly one, and the lines through the centres of the men will be straight. When the men are all in line, they will be ready to move forward in quick time or double time, as the commander may direct.

VI.

"Martial Law and Social Order."

Colonel A. B. Coit, O. N. G.

CAPTAIN CHESTER, in his admirable article on "Martial Law and Social Order" in the July number of this JOURNAL, deals with his subject exclusively from the point of view of an army officer of the United States. But the questions he raises and the proposals he makes apply for the most part with equal fitness and force to the duties and the difficulties of the National Guard in the maintenance of social order.

While in case of riot in any State, if the interests of other States are in jeopardy, the United States Army may be called out by the President, the several States provide that for the maintenance of social order, the National Guard may be ordered on duty in aid of the civil authority, by the governor, the sheriff of a county, the mayor of any

* As each man arrives near the line, he must move a little to the left before stepping into place, to avoid interfering with the man on his right.

municipal corporation, or by a judge of any court of the State or of the United States. On account of this law, embarrassing complications may arise in addition to those for which Captain Chester proposes the only remedy. For instance during the railroad riots in Chicago in 1894, it happened that (1) the Army, subject to orders from the President as Commander-in-chief, and (2) the Illinois National Guard, subject to the governor as Commander-in-chief, were both on duty for the ame purpose, viz.: to maintain the majesty of the law and protect life and property; at the same time (3), a police force equal in number to the United States soldiers on duty (4), a sheriff with a posse and (5) United States marshals with a large number of deputies, all armed, were on duty for the same purpose at the same place, all of the five separate armed forces were acting independently of one another. And they were accountable to five different heads,—the President, the Governor of Illinois, the United States Court, the Sheriff of Cook County, and the Mayor of Chicago.

Whoever pictures to himself such a state of affairs, with the possibility that any one of the various armed forces may receive orders contrary to those of the others and recalls to mind also the dual accountability pointed out by Captain Chester, by which soldiers and officers must obey their military superior but are punishable by civil authority, can perhaps imagine the mental agony that a few of the Army and nearly every guardsman of New York, Pennsylvania, Tennessee, Ohio, and the Virginias, has undergone within these last three years of social discontent and anarchic defiance of the law.

My experiences as Colonel of the 14th Regiment of the Ohio National Guard has brought home to me the anomalous character of the present laws for the suppression of mob violence and the necessity, as the first step toward radical reform, of the remedy proposed by Captain Chester. In order that soldiers may no longer be punishable by the civil authority but accountable solely to the military, the riotous district must be proclaimed to be under martial law, as Captain Chester says, "the troops must never go to assist the magistrate but to restore him."

My command has been ordered on duty to aid the civil authority ten times in ten years and in every case the military have asked from civil officers—What was to be done, but in every case have reserved the right to say how it should be done, assuming that the civil authority had lost control, and was in abeyance until order was restored.

In person, with a part, or all, of the 14th Infantry, and Battery "H," 1st Light Artillery, Ohio National Guard, I reported in the year 1894, to six different sheriffs. I was there in obedience to orders, all of which read as follows, except difference in place and date:

State of Ohio.
Adjutant General's Department,
Columbus, Oct. 17th, 1894.
2:30 A. M.

Col. A. B. Coit,
Commanding 14th Infantry,
Columbus, Ohio.

You are hereby directed to assemble two companies of your command at once and proceed forthwith to Washington C. H. reporting with said command to the Sheriff of Fayette Connty to act in aid of Civil Authority. You will take train on B. and O. Railroad leaving Columbus at 3:50 A. M. You will keep the Adjutant General fully advised.

By Command of the Governor,
James C Howe,
Adjutant General.

I well knew that there never had been a judicial decision defining what an officer could or should do. I did know that I had taken the oath to obey all legal orders of those placed in authority over me, and that the Governor, as Commander-in-chief, had ordered me to report to an officer of the State in aid of the civil authority.

In each case I received from the sheriff either verbal or written orders, to do certain things; and in every case I asked the sheriff if I was to use force, or to shed blood, if resisted by those defying the law of the State.

Every sheriff, in his official capacity, directed me to "carry out his orders at all hazards." To refuse was to be branded as a coward, to be tried by court-martial, and dishonorably dismissed from the service. To obey orders, I found in one case, was to be arrested on three counts for manslaughter, and for months under heavy bail, to await trial by a civil court.

Although I have been the only officer indicted under the laws of Ohio, yet nearly every officer of the Ohio National Guard was on duty in 1894 and under the same circumstances as myself would have found the local resentment of the riotous district seeking satisfaction in the form of a charge of murder or manslaughter.

At an expense of over a quarter of a million of dollars the National Guard of Ohio was on duty in 1894. Thousands of citizens were in armed rebellion; but not one lawbreaker was arrested, except four, who were arrested by my command and turned over to the U. S. marshals, were tried, convicted, and sent to jail.

At once, the laws of the several States should be so amended that the rights of life and property may be protected, the majesty of the law upheld, and those in rebellion punished, without exposing the instruments used by the State, to the malice of the mob, while those in rebellion go scot free.

What is an officer to do, when ordered by the President, or Governor of the State to report to a civil officer to aid civil authority and receives orders to disperse a mob at all hazards? Can he question the authority of the Commander-in-chief? Can he demand of the civil officer, "Have you exhausted all your powers?" Or can he demand that the law be produced showing that it is illegal to burn bridges, hold trains, or batter down doors of court houses?

No, he must obey orders, and if resisted, be arrested, at least so it was in my case, and by direction of the highest authority in the State be ordered to flee from the State, and be a refugee from justice for weeks, for the reason as stated "your arrest will probably incite more riot and bloodshed."

With these facts before us, army officers and guardsmen concur with Captain Chester in his conclusions, that that the troops should not be ordered on duty until all civil power has been exhausted, and not until after martial law has been proclaimed; and that the troops shall be accountable only to the military authority of the general government, or State. Armed resistance to law in such force as to require troops, is rebellion, and must be so treated.

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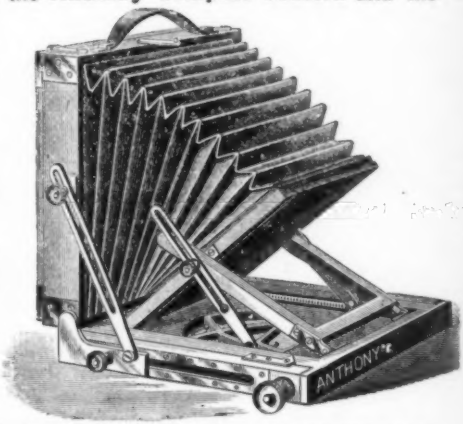

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Reviews and Exchanges.

Napoleon Bonaparte's First Campaign.*

LIEUTENANT SARGENT'S book upon Bonaparte's Italian campaign is receiving much favorable comment from the press abroad. The following reviews of the work from one of the leading journals of Great Britain will undoubtedly be of interest to our readers.

"Lieut. Herbert Sargent, Second Cavalry, United States Army, is to be heartily congratulated on his book, 'Napoleon Bonaparte's First Campaign.' A passage in the preface seems to indicate that he regards his work as merely a strategical study of interest to the military student only, but it is a great deal more than this, for no one, whether he be civilian or soldier, can after the perusal of this small volume, fail to realize vividly the stupendous genius of Napoleon Bonaparte as manifested even in the earliest years of his service in the field. In the campaign of Italy in 1796-97, which lasted some thirteen months, a mere boy six-and-twenty, starting from the extreme west end of Northern Italy, traversed that country with one small army, and after defeating in this single campaign six Austrian armies sent successively against him, compelled his enemy to sign a peace almost within sight of Vienna. Valuable as is this book as a treatise on strategy, its worth in this respect is far surpassed by its value as a lifelike portrayal of Napoleon, not only the strategist and tactician, but the general 'heaven born.' Lieut. Sargent says that another Napoleon will perhaps never arise; yet that imagination can picture a soldier who, holding in his grasp the telegraph and railways, shall plan and execute as great strategical combinations in the campaigns of the future as Napoleon planned and executed a hundred years ago. Perhaps so, but that soldier will not be the product of any amount of scientific military training; he will seem to spring from the earth already equipped, mentally and physically for the fray, just as, by this brilliant account of the very first step taken by Napoleon in his great career, the reader is almost compelled to believe that Napoleon himself did. But if the industrial world has been revolutionized by the steam engine and scientific discoveries, so has the art of producing strategical combinations of troops, and if the fracture of one tooth in a cog-wheel may for a time stop the working of thousands of looms, so a few ounces of dynamite judiciously used on a line of communication in modern war may render immobile a whole *corps d'armée*. Lieut. Sargent says truly that it was the marching as well as the fighting of Napoleon's soldiers that won for him so many victories against such overwhelming odds; but the Napoleon of the future will find introduced into his calculations of the time required for movements an element of uncertainty which did not exist in the era of the Napoleon of the past. We suggest to Lieut. Sargent that he should follow up his successful initial work by a series of monographs on the subsequent campaigns, showing as clearly as he has done in this in-

* *Napoleon Bonaparte's First Campaign.* With Comments, by Herbert H. Sargent, First Lieutenant Second Cavalry, United States Army. Crown 8vo, 231 pages, with maps, $1.50. A. C. McClure & Co., Chicago; C. D. Cazenove, London.

stance how in successive campaigns the personal, mental, and physical powers of the strategist affected and influenced both the conception and the execution of the strategy adopted."—London *Times*.

Horses, Saddles and Bridles.*

This work, though primarily adapted to the needs of the American service, contains much which will be welcomed by British cavalry officers, for within a comparatively small number of pages the author has brought together all the essential facts connected with saddlery and bitting throughout the world—facts which otherwise are only to be obtained by prolonged research and comparison in many different languages and works.

The cavalry of the United States may be numerically weak, but there can be no question as to the very high degree of excellence they have attained, having due regard to the special conditions of their employment; and since our own cavalry are frequently at work under very similar ones, a careful study of the means by which their efficiency is obtained cannot be too strongly recommended. At the same time the book requires to be read with caution, for as the Americans are essentially a practical race, less attention is paid by them to the breaking and schooling of young horses than is advisable in cavalries where absolute precision in manœuvre and cohesion in the charge form the chief reason for their existence.

In the chapter on the selection of remounts, the following excellent common-sense remark should be noticed: "Some horses apparently sound and without vice or fault, will still be far from desirable cavalry horses; a rough animal passed into the ranks will cause more discontent than he is worth."

Under the heading "Age of Horses" some interesting facts are recorded. The oldest horse of which the author had personal knowledge is "Belle Mosby," who went through the whole Civil War, and is still living at the age of thirty-five. A Mexican army mule, which died in 1866, could be traced back over forty years.

The chapter on the "Endurance of Horses" is of exceptional interest, giving many details of the waste of horses during the Civil War, and the steps taken to remount the army during its continuance; the organization of the "Cavalry Bureau," on which this duty fell, should be carefully studied. The daily waste of horses throughout the year 1863-4 was 500, *i. e.*, the rate was approximately .5 per cent.; this is heavy, but compares very favorably with many European experiences, notably with the French Grand Army in the march to Moscow.

Seats, saddles and bits are all treated with clearness and practical knowledge. Though the author's remarks contain nothing which in principle, at least, is not embodied in our own regulations, his views are stated in such a manner that the reason "why" is in all cases made sufficiently clear. This is a point in which "regulations" necessarily fail, and hence in the absence of properly qualified teachers, bad habits are apt to arise, which appear to be in accordance with the letter of the regulation, but are in reality entirely opposed to its spirit. To detect these mistakes and correct a long-established practice is often the most difficult task for a young officer thrown on his own resources; and a more valuable guide to enable him to train his judgment to act on his own responsibility in these circumstances, it would be very difficult to discover. —*Journal Royal United Service Institution.*

* *Horses, Saddles and Bridles.* By Captain W. H. Carter, 6th Cavalry, and Instructor to the Cavalry Department, Cavalry and Infantry School, Fort Leavenworth, Kansas. London: B. F. Stevens, 4 Trafalgar Square.